Railway Age

Vol. 85. October 20, 1928 No. 16

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Railway Age

Vol. 85, No. 16 October 20, 1928 Table of Contents Appears on Page 5 of Advertising Section

An Opportunity for Economy at Terminals

IN a territory served by many railroads, where industries are numerous but rather widely separated with intervening land relatively undeveloped, and where the topography is flat, the tendency for railroads has been to build right and left, each system having its own network of lines superimposed on those of others. Recent observation in such a territory brings the conclusion that such situations—and there are several of them in North America—offer a fertile field for improving railroad efficiency. Where topography is unfavorable and construction costly, the situation is different. In such localities, generally speaking, some carriers have elected to spend the money necessary to cover the territory completely while others have saved this extraordinary capital outlay and are, or should be, content with their relatively less favorable position in respect to the traffic. To have all railroads collaborate in a joint operation in such a situation as the latter would be an injustice to the roads which have invested millions in terminal development and would unduly favor those lines which have elected to save in capital expenditures at the expense of traffic volume. Such situations as the latter, however, are far from the general rule. There are a number of localities important from a traffic standpoint where virtually all lines are on an approximately equal basis from a standpoint of convenience to shippers and receivers of freight. Such approximate equality has been attained, too often, by a needless duplication of facilities. Does not the elimination of some of this duplication, by cooperative action by the railroads concerned, offer an attractive opportunity for reducing the costs of operation.

Why Is This Necessary?

A SIGNIFICANT attitude on the part of officers of the supervisory class was brought out in the discussion of one of the reports presented before the recent convention of the Roadmasters' association at Detroit. Decided objection was made to the suggestion of one of the committees to the effect that appreciable economies might be obtained through a reorganization of track maintenance forces which would result in the grouping of the section men in a smaller number of gangs. Most of the objections offered were pertinent; emphasis was placed on the importance of the section foreman as an inspector of track, on the problem of training new men, on the difficulties of providing supervision at many different points during winter storms, etc. However, it was readily apparent that the main objection was founded on a feeling, which for want of a better term, must be characterized as a lack of confidence in the managements—that an increase in the length of sections would not always be accompanied by a corresponding increase in the number of men per gang. "What assurance have we that the managements of some railroads will not continue to think of the section gang as consisting of six or eight men in spite of a considerable increase in the length of the section?" is the way that one speaker expressed it. That those who discussed this proposal were not unmindful of the grave problems confronting the railway managements is indicated by the remarks of one roadmaster who conceded that the railroads will be compelled to make further curtailments in expenditures for the upkeep of unprofitable lines, but the clearly apparent attitude that any such proposal as a reduction in the number of gangs was one that could not be discussed solely on its merits, is a matter to which the managements of American railways may well give serious thought.

Effective Work of Car Interchange Bureaus

MUCH has been accomplished in avoiding unnecessary freight car delays and transfers of lading at large industrial centers by the car interchange bureaus, neutral organizations which owe their effectiveness to the fact that, as a whole, they are composed of energetic, reliable men, thoroughly trained in car department and operating details. The results in Chicago, for example, were pointed out by L. R. Wink, assistant superintendent of the car department, Chicago & North Western, in a recent paper at the St. Louis convention of the Master Car Builders' and Supervisors' Association, as follows: "It is interesting to know that 11,000 cars were transferred in the Chicago territory during 1924, this number being reduced to approximately 1,500 cars in 1927. The A. R. A. loading rules are being complied with, and both loaded and empty cars are moving through the Chicago terminal more expeditiously than ever before; but the most gratifying accomplishment is the splendid relations that exist between the shippers and the carriers. I have no doubt that similar efficient results have been accomplished at other large terminals but the fact remains that too many cars are still being transferred; too many cars are still being improperly loaded and there is still too much cross hauling of equipment throughout the country." Existing car interchange bureaus deserve the hearty support of all concerned, and new ones should be established, as Mr. Wink maintains, "at points where a sufficient number of roads terminate to warrant it." In addition it will pay the railroads to supplement the work of the interchange bureaus by providing closer initial inspection of cars before loading at freight houses, industry tracks, etc., and by making sure that the operating department co-operates with the car department to provide sufficient time for a reasonably

thorough inspection of cars at intermediate terminals en route, a condition which at the present time does not always obtain.

Electric Power Applications in Railway Shops Increasing

THERE has been a large increase in the use of electric power in America in recent years, in which increase the railroads have participated in no small way. In his recent speech of acceptance of the republican party's nomination for president, Herbert Hoover stated that during the last eight years, "We have doubled the use of electric power and with it we have taken sweat from the backs of men." This increase of 100 per cent in the application of electric power since 1920, the year in which the railroads were returned to private operation, is, in no small part, the result of increasing power applications at railway repair plants, in roadway operations, and for traction purposes. Witness the new Illinois Central shops at Paducah, Ky., with an electrical connected load of 7,360 hp. The noteworthy feature of this large installation, as is evident from the article published elsewhere in this issue, is the diversity of the electrical applications found. In the power house, for instance, which is employed as a boiler plant primarily, there is a 500-hp. motor on an air compressor, in addition to motor-driven fire and boiler feed pumps, as well as an electrically-operated coal and ash-handling system. Every one of the 315 machine tools is individually motor-driven, many being equipped with power-drive connections that are exceedingly simple. On a number of the radial drill presses, the motors and control equipment are mounted as near to the cutting tools as it is possible to have them, an improvement in machine tool construction which greatly simplifies their manufacture and assembly.

An outstanding characteristic of electric power is its inherent flexibility of control, which enables it to be applied to any special machining operations in railway plants. Direct current reversing planer equipments and driving wheel lathes are two noteworthy examples of special applications which accentuate this flexibility. Mention should also be made of other electric power equipment in this modern plant, such as a tire heater, flue welders, rivet heaters, welders, babbitt pots and oil furnace automatic temperature control. In common with many other railway shops, the unit heater system is employed in all of the buildings, each of the 153 units having a motor-driven fan. To provide effective ventilation control, motor-operated window shutters are installed, while storage battery trucks and tractors facilitate inter-shop transportation of materials.

As the result of electric power applications such as the foregoing, the responsibilities of the electrical men on the steam railroads have greatly multiplied within recent years. There is every indication that such applications will continue to increase. Railway officers can afford to watch this significant trend of the times, because electric power has demonstrated unmistakably that it possesses many inherent advantages that can be utilized profitably in lessening operating costs. Its economic potentialities in the field of railway transportation are better recognized today than was the case some years ago. Those who keep in touch with the new developments in electric power as applied to railway use will surely reap a substantial reward.

Rates and the Railways

THERE is growing recognition of the fact that some of the most vital current problems of the railroads are traffic problems. Within recent years the thoughts and energies of railway officers have been devoted principally to enlarging and improving the physical properties, improving operating methods and service and seeking to satisfy shippers by co-operating with them in matters affecting service. It has been more or less assumed that if service was made good and operation was conducted economically the rates of the railways would be so adjusted that in due course they would be able to earn a fair return. That assumption has proved to be ill-founded. There is a good deal of study being given now to the reasons for this and to the means that should be adopted to enable the railways to benefit more by increases in the efficiency and economy of operation.

The advances in wages that have been made within recent years have been partly responsible for the failure of net operating income to increase in proportion to the increased investment in the railways. There have been other causes, however. Among these, of course, have been the decline of passenger business and the failure of freight business to grow anywhere near as rapidly as it did before the war. Another important cause has been the tendency of freight rates to decline; and railway officials have begun to question whether this has not been attributed too largely to regulation and not largely enough to the policy or lack of policy of the railways themselves.

The traffic department of a railroad has one important function. This is to get earnings. Its function is seldom stated in this way, however. It is more often said to be to "get business." But suppose that a single railroad or the entire industry, when it is being operated with unprecedented efficiency and economy, gets a record-breaking business and, at the same time, does not make reasonable or adequate net earnings. It is evident then, that, its total earnings are too small, and that this is because its rates are too low. The function of the traffic department is not only to get business, but to get rates which when applied to the business will enable the railroad to operate at a reasonable profit.

This seems elementary. Nevertheless, most railroads, although being economically operated, and handling a large freight business, are not making satisfactory net earnings. In these circumstances, it would appear that the general tendency of rates should be upward. On the contrary, it is downward. The reason, of course, is that the traffic department's function of getting adequate rates is not being successfully performed. This is not said in criticism of traffic officers. It is simply the statement of an indisputable fact.

The tendency of freight rates to decline is not a new phenomenon in this country. Prior to twenty years ago it was due to competition between the railways themselves. More recently it has been due to both regulation and competition. It often has been said that there no longer is competition in rate-making, but that is not true. There is still competition in rate-making between railroads in the same territory, and also between railroads in different territories. It often causes an individual line to make a reduction in rates in the hope of getting a larger share of the traffic of some important industry, shipper or community, or of enabling business interests on its own lines to compete more successfully with business interest on other lines. Of perhaps even greater importance is the fact that com-

petition often prevents one or more railways from joining in movements to advance the rates of important shippers or communities. In a period when there is constant pressure for reductions of rates, which often is backed by regulation, the effects of the refusal of individual lines to co-operate in initiating justifiable advances may be very serious. Some reductions are unavoidable, and if advances that regulating authorities might approve are not initiated by the railways, the tendency will be for reductions to exceed advances and the railways themselves will be partly responsible for it. Competition that prevents advances may have quite as bad an effect on earnings as competition that causes reductions.

In spite of all the regulation of rates for more than a quarter century, there are still many inequalities in them. These may not be unfair discriminations, but they do result in certain traffic contributing less to total earnings than it should. The existence of these inequalities has been repeatedly mentioned by the Interstate Commerce Commission, and is generally conceded by shippers and railway traffic officers. There are many clever traffic men representing communities and industries who are constantly searching through the tariffs for inequalities in rates. When they find a relatively high rate and a relatively low rate that can be compared with any reason at all, they are likely to demand a reduction of the relatively higher rate. Thus a rate that is relatively too low is harmful, not only because it does not yield enough revenue, but because it serves as an argument for the reduction of rates that are remunerative.

The railways, and especially their traffic officers, might well profit by the example set by labor leaders and the traffic representatives of shippers and communities. An inequality in wages always serves the labor leaders as an argument for an advance in wages. Inequalities in rates serve many industrial traffic managers as arguments for reductions of rates. So long as the railways are earning nowhere near a fair return, inequalities in rates can be used much more fairly and logically for advances than reductions in them. But the traffic manager of a railroad lives in constant fear of the big shipper and the big industrial or commercial community. If he advances a rate without all competing lines advancing it, he will lose traffic for his road. If he attempts, whether successfully or unsuccessfully, to get competing roads to join in an advance, his road is likely to be penalized by the diversion of traffic from it.

The only solution of the problem of getting adequate rates is through better co-operation between the railroads. They must stand together better in opposing unreasonable reductions and in initiating and struggling for reasonable advances. But will they, or can they, do this as long as they have practically no traffic organizations excepting those composed of the officers of individual lines? May it not become necessary for them to form rate committees composed of men who are not connected with individual lines, but who represent entire groups of railways or the railways as a whole? They have had such committees on freight classification. Is there any other available way in which they can be relieved sufficiently of competitive pressure to enable them to so solve the rate problem as to secure and conserve adequate revenues?

The Interstate Commerce Commission said in its opinion in the western rate advance case: "It is clear upon the record that there are many inequalities in the rate structure existing in portions of the western district that should be corrected." It made clear, however, that it would not assume the responsibility of initiating the advances needed. It said: "That function belongs to management and not to regulation. It is the right and the duty of the carriers to take the steps necessary to correct improper rate relations as they may be found to exist and *to supply revenue deficiencies by initiating suitable changes in rates.*"

What that means is plain enough. To the extent that the earnings of the railways are inadequate because of the existence of rates that are too low they will continue to be inadequate unless the railways themselves take the initiative in correcting the condition. Representatives of shippers will continue to search through the tariffs for comparison of rates that they can use as arguments for reductions. The commission will not search through the tariffs for comparisons of rates that can be used as reasons for advances. If this is to be done, the railways must do it themselves.

If fair and reasonable advances are to be secured the railways must set up and operate the machinery for securing them. If they let competition prevent them from doing this their security owners will have to go without the earnings that might otherwise be secured, while their patrons will have to stand whatever indirect losses are caused by the adverse effects produced upon railway service.

Traffic and the Car Supply

THE railways are now handling the peak traffic of the year. The effect produced by it on the supply of freight cars is significant.

Total car loadings in the week ended September 29 were 1,196,768. This was an increase of about 53,500 loads over the preceding week. It not only exceeded the loadings in the corresponding week of either 1927 or 1926, but was the largest week's loadings in history, excepting those in the last three weeks of October, 1926, which it closely approached. The effect produced by the increase of loadings upon the car surplus was to reduce it from 146,800 cars to 103,906 cars within a week. This was the smallest car surplus reported for the same time of year since 1923.

It is probable that the railways will get through the fall and winter without having actual shortages of any class of cars, but they are coming nearer to having them than at any time within five years. Shipments of coal, after having been abnormally small for months, increased 33 per cent between the first week in August and the last week in September. Meantime, shippers of sand and gravel were loading an unusual number of cars and there were large demands for open top cars from some other sources. Consequently, the surplus of open top cars sharply declined. The peak demand for refrigerator cars was very large. Shipments of automobiles and numerous other classes of commodities created an almost unprecedented demand for box cars. Shipments of grain and grain products became the largest since 1924. The supply of all kinds of cars quickly declined because of the increased demand for the movement of so many different kinds of commodities.

There has been some interesting discussion recently in the columns of the *Railway Age* and elsewhere as to whether the railways needed more or less freight cars. For a long time the number of cars retired has been exceeding the number installed. There were more cars installed and retired in 1923 than in any other year in history. In September of that year the number reported as owned by the Class I roads was 2,305,648. The number owned increased pretty steadily thereafter

until the figure of 2,380,875 was reported for August, 1925. It has been declining ever since, and in July, 1928, was 2,316,716, or the smallest since October, 1923. Retirements have since continued to exceed installations, and when the peak of the traffic was reached this fall the railways owned at least 75,000 less freight cars than three years ago. The reasons why they have been able throughout this period to render the best freight service in history with a diminishing number of cars have been of course, that there has been an increase in the strength and capacity of the average car and a constant increase in the efficiency with which cars have been used.

A more than seasonal expansion of traffic in the latter part of a year, such as is occurring now, usually has been the forerunner of a large or even record-breaking volume of freight business for months or even a few years subsequently. Developments affecting railway traffic since the war have been so different from those before the war that it is much harder than it formerly was to forecast demands for the transportation. It can hardly be seriously questioned, however, that, at present, the prospective freight traffic of the railways is large.

Do the present situation and the prospective volume of traffic indicate that the railways now need or soon will need more freight cars? In an article published in the *Railway Age* of October 13, M. J. Gormley, chairman of the Car Service division of the American Railway Association, said: "We made the statement in 1927 that the business of the country could be handled for some time to come with a decrease of 100,000 cars in units of railroad ownership, provided there was a continuation of the program of replacing with larger cars the smaller and inefficient cars. A year and a half has gone by since that statement was made, but if our opinion were asked today, the answer would be to increase the number of cars that could be dispensed with rather than to decrease that figure."

Mr. Gormley, is, of course, a very high authority upon this subject. His statement that the railways could get along with less cars was, however, it should be noted, qualified with the words, "provided there was a continuation of the program of replacing with larger cars the smaller and inefficient cars". In the year and a half to which he alluded the number of cars reported as having been retired was about 141,000, while the number reported as having been installed was about 105,000. Thus apparently one-third of the reduction in the number of cars he estimated could safely be made had occurred when he wrote his article, and probably one-half of it has occurred by this time. Have new cars been acquired rapidly enough to insure an adequate car supply, on Mr. Gormley's theory that the total number could be safely reduced, provided enough new cars of greater strength and capacity were installed? The recent freight car situation has been such as to make well worthy of consideration the question as to whether there is not danger that the car supply will be allowed to become too small, either because of excessive reduction of the total number of car units or of failure to substitute new cars rapidly enough for those retired.

The recent decline in the amount of new equipment acquired has not been entirely due to the belief of railway managers that there was no danger whatever of inability on the part of the railways to handle traffic satisfactorily. It has also been due in large measure to the decline in net operating income since 1926, which has made many managements disposed to reduce the investment of capital on which experience showed there was no certainty that they would be allowed to earn an adequate return. The recent car situation may be a warning to the railways that they need to install new and improved equipment more rapidly. It should also serve as a warning to shippers, regulating authorities and the public that, the provision of adequate railway transportation requires the constant investment of a large amount of capital, and that, in the long run, the investment of new capital will not be adequate unless a reasonable return is allowed to be earned upon both old and new railroad investment.

Civic Pride in Railways

JUDGED by its actions, the Retail Merchants Association of Buffalo, N. Y., is a forward-looking body. In a recent issue of a Buffalo newspaper, this association took a full-page advertisement to put across the following message to the public: "Excursions invite summer visits to Buffalo. Convenient, comfortable, cool, safe and decidedly economical excursions to Buffalo are featured these delightful week-ends by the Erie and Lackawanna railroads serving the city's neighbors. If you wish to avoid all the responsibility of personal driving and give up every minute to enjoyment, this is the most satisfactory way to visit Buffalo. You will find at each railway terminal, busses, taxis and street cars that will take you quickly, easily and safely to any part of the city. You will save time and be quite as happy as in your own car. Then, too, the extra hours that might be spent on the highway can be enjoyably and profitably spent on a shopping trip."

The railways mentioned were not informed that this advertisement was to be run, nor did they play any part in its inception. It was exclusively the idea of the retail merchants. Undoubtedly, it was actuated to a certain extent by gratitude to the railroads for their present excellent freight service, which has enabled retail merchants everywhere to carry much smaller stocks and, accordingly, run much smaller risks. There, is however, another angle that may have had something to do with it. The automobilist entering a city does little shopping. The parking problems and unfamiliar traffic laws in the downtown district cause him to shun it. Usually, the motor tourist patronizes some outlying gasoline station, and possibly a suburban hotel. This is not profitable for the retail merchants. The passenger arriving in town on a train, however, is there to stay, at least, until the next train leaves. The downtown section has no terrors for him, in fact, it is one of the chief attractions. Moreover, he is walking along the sidewalk, where he can see the window display at his leisure. The strange automobilist driving in any downtown section has precious little attention to give to shop windows. The manner in which this works out to the detriment of retail merchants in downtown sections is perhaps best illustrated by the tremendous growth of filling stations, restaurants and stores along the highways outside of town. The excursionist whom the railways formerly brought to the retail merchant in the business district is now spending his money along the highway, where traffic congestion is not so great. Under the circumstances, it is to the advantage of the retail merchant to co-operate with the railways in promoting excursion business. And it would certainly not be amiss for railway officers, in talking with retail merchants, to bring out this important point.

Looking West Through the Car Repair Yard and the Enginehouse Approach Tracks

Big Four Completes New Terminal at Cincinnati

Improvements at Riverside include flat switching yard and locomotive facilities

A MARKED improvement in terminal facilities has been effected by the Cleveland, Cincinnati, Chicago & St. Louis at Cincinnati, Ohio, through the construction of a new engine terminal and the rebuilding of its classification yard at Riverside on the north bank of the Ohio river, about four miles west of the Central Union station. The project comprises the replacement or revision of the existing facilities at Riverside, which is on the main line of the Chicago division and has long served as the point where incoming freight is classified for delivery by transfer crews to other railroads or local destinations in the city, and where westbound outgoing trains are made up. The engine terminal serves not only freight, transfer and switch engines but all Big Four passenger engines entering the city as well, as it is located closer to the passenger terminal than the facilities on its Cleveland line, which enters from the north via the Mill Creek valley.

Additional Right of Way Necessary

The bench at the foot of the bluff bordering the river, on which the Chicago division is located, is occupied also by the main line of the Baltimore & Ohio and has long been developed as private residence and business property. As a consequence, the enlargement of the railway facilities at Riverside could be carried out only through the purchase of numerous parcels of improved property and the vacation of streets serving them. Furthermore, extensive grading was required to make such land of use for railway purposes. These problems, together with those of eliminating four crossings with streets within the yard area, served to introduce many complications in the development of the improvements.

In general, the project included the building of a complete new engine terminal on a new site north of the tracks at the west end of the yard, the incorporation in the classification yard of the area occupied by an old engine terminal, in addition to which the main tracks at the east end of the yard as well as those of the Baltimore & Ohio were moved toward the river by taking out a sharp reverse curve to permit an extension of the yard tracks to the east.

The classification yard consists of a grid of 33 tracks designed for flat switching, arranged in two groups. Yard No. 1 at the north side of the layout, which has 14 tracks with capacities ranging from 93 to 100 cars each and a total capacity of 1,366 cars, is used as a receiving and departure yard for movements from, and to the west. A caboose track of 8 cars capacity is provided to the north of the yard at each end. Yard No. 2 at the south side of the layout has 19 tracks with capacities ranging from 5 to 88 cars, or a total capacity of 949 cars and is used as an interchange and classification yard.

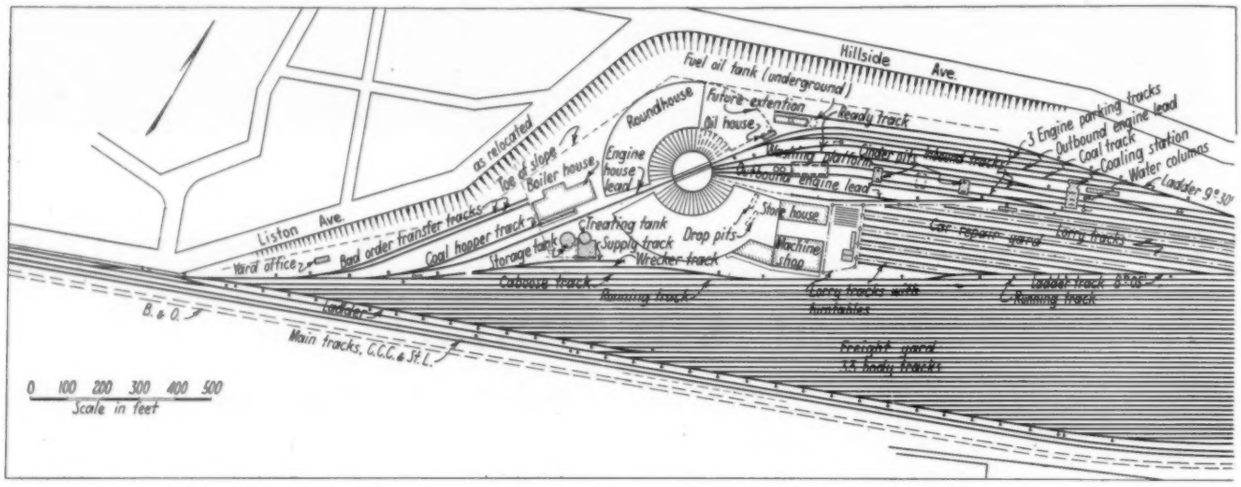
Separate Leads for Each Yard

As seen on the map, the two yards are designed for switching from either end and it will be observed that the ladder tracks of Yards No. 1 and No. 2 are served by independent switching leads so that either yard may be switched without interference by movements on the ladder tracks of the other. A 150-ton, 50-ft. track scale is provided on the short track that serves as the connection between the east and west ladders of Yard No. 2. It is, therefore, equally accessible to switching crews operating in the two ends of the yard.

Two tracks which hold 11 cars each, are provided north of the west throat of the yard for the transfer of lading from bad order cars. A car repair yard of 11 stub

tracks, with capacities ranging from 4 to 24 cars, lies just to the north of Yard No. 1. These tracks are spaced alternately 22 ft. and 18 ft. center to center with lorry tracks in the 22-ft. intertrack spaces, the lorry tracks being connected at the west or stub end of the yard by a transverse track equipped with turntables.

The engine terminal is located north of the switching yard at its western end, with the main approach facilities lying to the east of the roundhouse, but with provision for one lead track from the west throat of the yard, the roundhouse being constructed in two sections to afford this track entrance to the turntable. The roundhouse as now built has 29 stalls, with provision for the addition of 16 more stalls in the future. The stalls are 125 ft. long, with the exception of Stalls 1 to 5 inclusive which were



Engine Terminal and West End of the Riverside Yard

made longer to form a connection with the storehouse and machine shop which lie east of the house, south of the main approach lead.

A Carefully Planned Approach Layout

Five tracks connect the turntable with the approach layout. The most northerly of these leads to a grid of three engine parking or hold tracks. The other four comprise the main lead—two inbound tracks in the middle with an outbound track on each side. All four of these tracks are served by a coaling station and by two water cranes. The two inbound tracks pass over two two-track cinder pits of the submerged type and a concrete washing platform. In the vicinity of the cinder pits the outbound tracks are spaced a sufficient distance from the inbound tracks to make room for a cinder car track on each side of the pits. Space has been provided for a third cinder pit, to be added if found necessary. As will be noted on the map, the enginehouse approach is served by a double ladder, the outer one connecting with the inbound engine lead and the inner one with the outbound engine lead in such a way as to reduce interference between inbound and outbound engines to a minimum. The turntable is of the Bethlehem twin-span type with a length of 110 ft.

The roundhouse has a frame that is a combination of gable and flat roof construction with the gable section adjacent to the outer wall supported by trusses having a span of 49 ft. With the exception of brick walls for the

Looking West From the East Throat of the Yard

Showing enginehouse approach on the right, switching yard ladders in the center and the relocated main tracks of the Big Four and the Baltimore & Ohio on the left

outer circle and the five radial walls and cast iron door posts, the superstructure of the house is of wood construction, the distinctive feature being the use of creosoted Douglas fir for the frame and roof. Resistance to decay of the timber being thus assured, all bolts, nuts, washers and gusset plates used in the framing were galvanized to insure resistance to corrosion. The doors and windows are also of wood construction. The roof covering is of five-ply built-up roofing. The floor is concrete six inches thick. The smoke jacks and ventilators are of cast iron, furnished by the Paul Dickinson Company, Chicago.

Hot Air Heating System

The building is heated by hot air delivered through underground concrete ducts with vitrified tile branches from a fan room in the power house equipped with two Sturdevant fans and heating coils. All hot air outlets in the roundhouse are equipped with registers to permit of regulation of the air discharge. Artificial lighting is provided by six 200-watt lamps suspended from the roof frame between each pair of stalls. These are equipped with Benjamin weatherproof fixtures and shades. In addition, an outlet for extension cords is provided on one post between each two stalls.

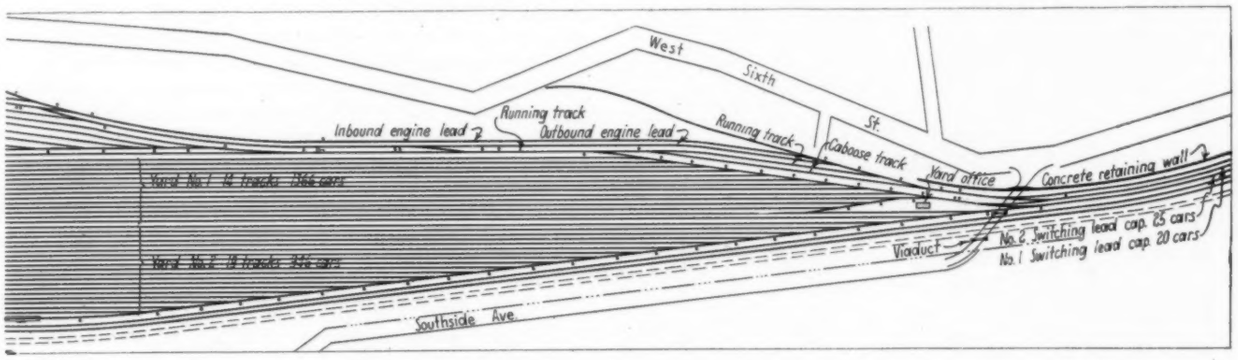
The engine pits, 95 ft. long, are of concrete with a crowned brick floor, the side walls being battered outward on the outside to afford ample top width outside the rails for jacking. Two wheel drop pits are provided, one serving Tracks No. 2 and No. 3 and the other Tracks No. 4 and No. 5, the pits being equipped with Whiting drop tables, one of 25 tons capacity and the other 50 tons capacity. Track No. 4 is continuous through a door at the rear of the stall into the repair shop.

Install Direct Steaming System

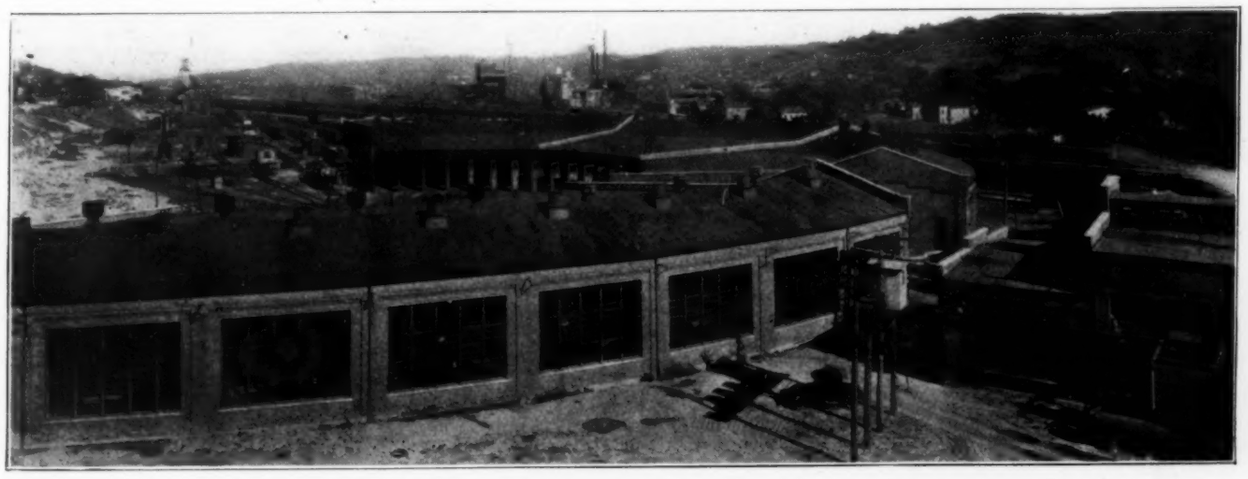
Being located within the city limits, the Riverside terminal is subject to the Cincinnati Smoke ordinance and it was necessary therefore, that the railroad provide some effective means of preventing the emission of objectionable smoke and gas from the enginehouse, before permission could be obtained to construct it. A locomotive smoke-collecting system with ducts leading to a smoke washer was first considered but later abandoned in favor of the direct steaming system because of other advantages in the way of fuel economies, etc., which could be realized.

As a consequence the requirements of this system were taken into account in the design of the power plant, which is located just north of the west lead to the enginehouse. Instead of three 300-hp. boilers, the plant was equipped with five 400-hp. Heine boilers with underfeed stokers, furnished by the Combustion Engineering Company and arranged in two double and one single setting. The boilers carry 200-lb. pressure and are designed for forced draft operation, with which they are capable of developing 200 per cent rating. General Electric turbine-driven centrifugal pumps supply feed water to the boilers from an open-type feedwater heater, which draws exhaust steam from two compressors in the engine room.

The power plant building has been ingeniously planned to house not only the boilers and compressors but also the hot filling and washing water tanks and pumps, and

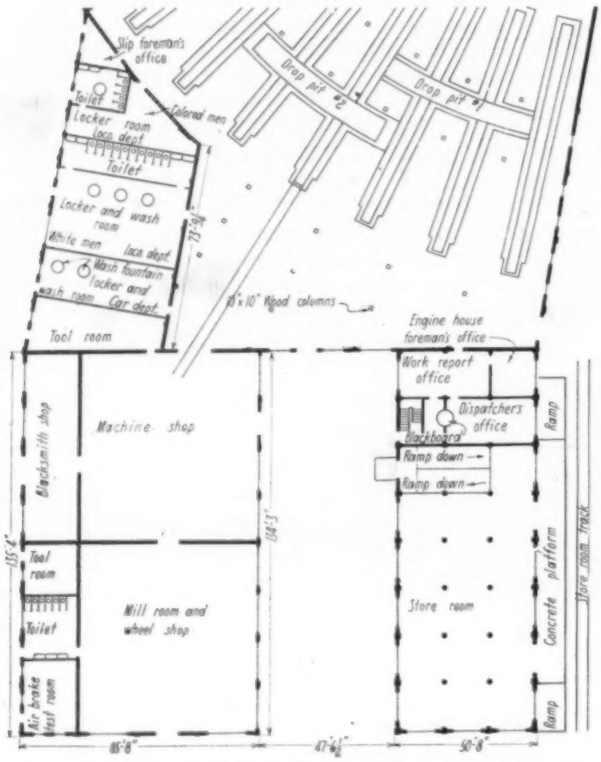


East Half of the Riverside Yard



A View of the Engine Terminal from the West, Power House at the Right

the hot air heating fans and coils which are located in adjacent rooms. The stokers are fed with slack coal from a weigh lorry running along the firing aisle. At the far end of this aisle, the weigh lorry is run out of doors through an aperture in the wall and charged with coal from a cylindrical steel bin of 50 tons storage capacity. This bin is supplied from a concrete track hopper on the



Floor Plan of the Shop and Store House and Adjacent Portion of the Enginehouse

adjacent coal-unloading track by means of a Beaumont skip hoist. Ashes from the stationary boilers are delivered to a car on the upper end of the coal-unloading track by a steam jet conveyor.

Piping Layout

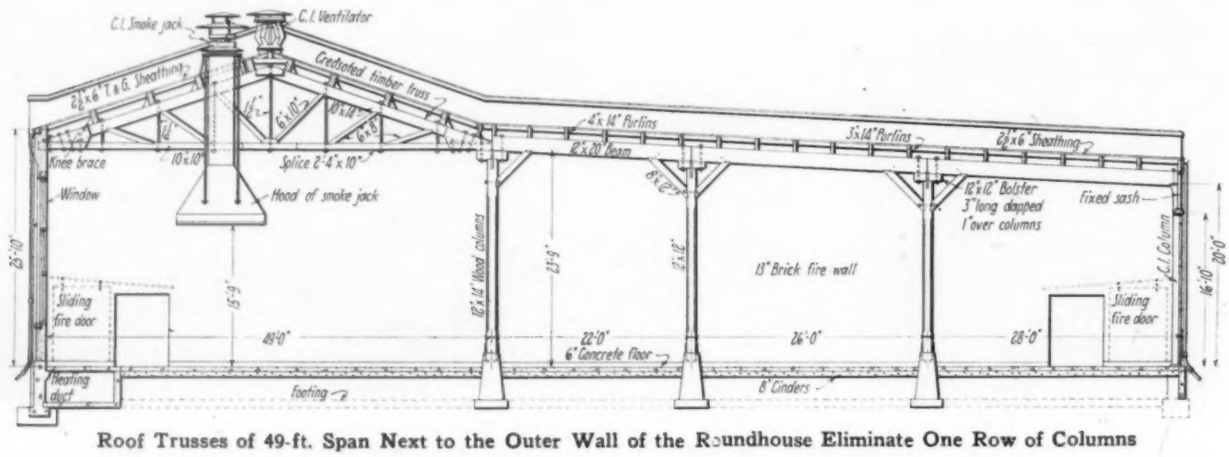
An eight-inch high-pressure steam main leads from the power house to the enginehouse where it branches into two six-inch mains extending around the house, the last section being reduced to four-inch diameter. The steam blow-off, washing and hot filling water mains, are carried from the power plant to the enginehouse and across the gap in the enginehouse on steel bridges, and grouped on the same hangers throughout the house. with one-inch extension lines running forward to the stack blower drop at each stall. The washing water line is equipped with rigid drops attached to the posts at alternate stalls, but the blow-off and hot filling water lines are combined with the high-pressure steam line in a single flexible drop hanging from the overhead mains at each stall, all valves being in the branch connections overhead. The control of the valves and the combination drop, equipped with Barco flexible joints, are arranged similarly to those in the enginehouse of the Texas & Pacific at Fort Worth, Texas, described in the *Railway Age* of September 15. The operation of the system is substantially the same as there explained.

With this equipment, it is possible to hold locomotives under steam or to refill and steam other locomotives to a working pressure and corresponding water temperature throughout the boiler without lighting the fire on the grates, although it is customary to spread a bed of coal over the grates while the locomotives are standing in the enginehouse, so that the heat of the surrounding firebox sheets will thoroughly dry out this coal before the fire is ignited outdoors. When the locomotive is ready to move, it is disconnected from the steam supply and moved under its own steam to fire lighting stations on the outgoing tracks. The locomotive is usually supplied with about 160-lb. boiler pressure before leaving the enginehouse and loses from 10 to 15 lb. of this pressure in moving to the fire station.

Provide Fire Lighting Stations

These stations comprise small frame structures with concrete floors, housing an oil cart, the oil and air hose to the torch and the torch itself when not in use. Compressed air is piped to each station. The oil carts are wheeled to the storehouse for refilling by the firelighters to provide a check on the quantity of oil used for lighting fires. From five to seven minutes are required to ignite the fuel bed thoroughly and the locomotive then moves down to the coaling station. As soon as the tender can be filled with coal and water, the locomotive is ready for its run. It is dispatched frequently within 15 min. from the time it leaves the enginehouse without a fire on the grates.

The results obtained, from the standpoint of smoke elimination are said to have proved entirely satisfactory to the city officers responsible for smoke abatement. An incidental advantage which has been developed since



Roof Trusses of 49-ft. Span Next to the Outer Wall of the Roundhouse Eliminate One Row of Columns

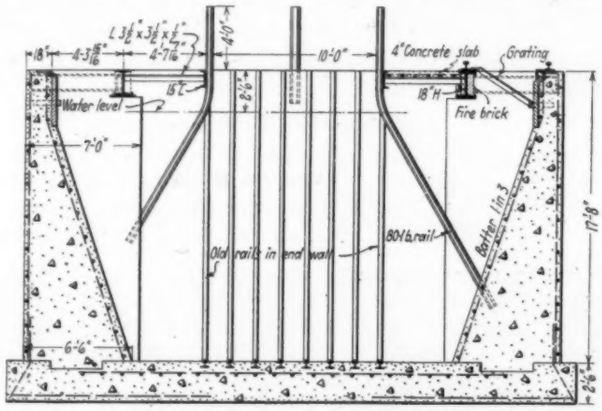
the enginehouse has been in use is the greater convenience in handling boiler defects disclosed after the engine has been steamed up. In the event of such a contingency it is no longer necessary to run a locomotive out to the cinder pits to dump the fire before it can be blown down preparatory to doing the necessary work.

The direct steaming system installed at this terminal was designed and licensed by the Railway Engineering Equipment Company, Chicago, and installed by the National Boiler Washing Company, contractors, Chicago, in conjunction with a National hot water wash-out and fill-up system, which is located in the power plant building.

Auxiliary Facilities

Extending east from the enginehouse as two wings separated by a court 48 ft. wide, are two other buildings, a one-story structure with brick walls and steel roof trusses serving as a shop and a two-story building with reinforced concrete frame and brick curtain walls used as an office and a storehouse. The shop building, 134 ft. 3 in. by 58 ft. 8 in. in plan, is divided into two equal units, the one nearest the roundhouse being used as a machine shop and the other as a woodmill and wheel shop for the car repair yard which is located just to the east of it.

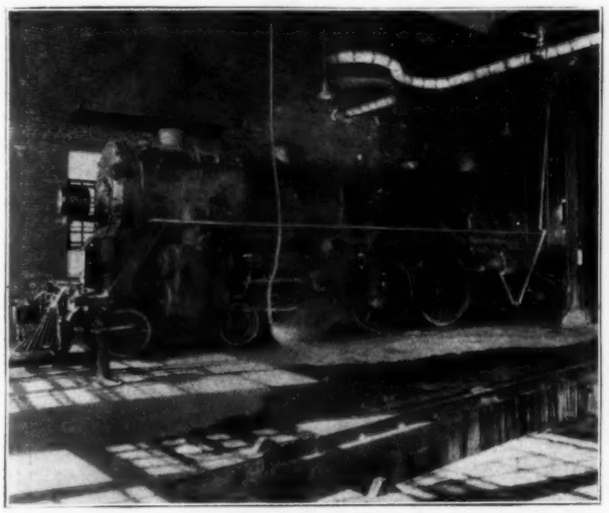
The reinforced concrete building, 135 ft. long by 50 ft. 8 in. wide, is occupied on the second floor by an engine-



Cross Section of the Cinder Pits

men's rest and locker rooms, an assembly room and general car repair foreman's offices. On the first floor, the two bays next to the roundhouse, with the floor slightly above track level, are occupied by the enginehouse foreman's office, a work report room and an engine dispatcher's office, while the rest of this floor, which is at car floor level, and the basement underneath are used as store space. Ramps from a door at track level lead up to the first floor and down into the basement. The store space is also served by a track on the north side abutting on a concrete platform 85 ft. long and 10 ft. wide with ramps to the track level at each end.

The cinder pits are of distinctive design by reason of the completeness of the protection afforded against a man walking or falling into them. Each pit is 28 ft. 6 in. long by 31 ft. 8 in. wide and serves two tracks spaced 25 ft. center to center. The outer rail of each track rests on the outside wall while the inner rail is supported on an 18-in. 93-lb. Bethlehem girder beam. The space between the rails of each track is covered by a heavy bar grating which offers no interference to the dumping of cinders but affords ample protection for the men, while a width of 4 ft. 7 in. inside the inner rail is covered by a concrete walk. This leaves an opening in the center of the pit 10 ft. wide by 21 ft. long, through which a clam shell bucket removes the cinders, this opening being enclosed on all four sides by three 5/8-in. steel cables, supported by 80-lb. rails which also serve as guides to keep the buckets from striking the under side of the two platforms. Rails are also embedded in the bottom and end walls of the pit to protect the concrete from damage by



Applying the Direct Steaming Process to a Pacific-Type Locomotive

the buckets. The inner side of the track girder and the wall under the outer rails are protected above water level from the hot cinders by fire brick facing.

Build New Coaling Station

The coaling station is a reinforced concrete structure with a storage capacity of 500 tons and has two skip hoists of the counter-balanced bucket type with a combined capacity of 70 tons per hour. The buckets, of 1¼ tons capacity, are filled from the track hopper by auto-

One of the Fire Lighting Stations, Showing the Oil Cart

matic loaders and are handled by an automatic reversible hoist operated by a 15-hp. constant-speed motor.

In keeping with the trend in modern coaling station design, the main storage bin is divided into four equal pockets and coal from each pocket is available to locomotives on each of the four tracks. This practice is growing, because in addition to permitting the handling of several grades of coal, it divides the coal storage space into small sections and, consequently, reduces the separation of lump and slack coal, lessens the hazard of

spontaneous combustion and makes it convenient to clean the entire bin without impairing the service to the locomotives.

At present, breaker bars having 9-in. by 12-in. openings are provided over the receiving hopper, but the hopper is so designed that a crusher can be placed beneath it. Screen bars have also been placed in the top of the structure to screen the coal as it is delivered from the buckets. Deflector gates and chutes provide for gravity delivery of the screenings and lump coal to their respective pockets. These screen bars are so arranged that they can be made inoperative, if it should be desired to handle run-of-mine coal through the plant to the locomotives. The plant was designed and constructed by the Ogle Construction Company, Chicago.

The Coaling Station Is a Reinforced Concrete Structure Throughout

Water Facilities

The water facilities at the terminal include a softener plant with a capacity of 40,000 gallons per hour, furnished by the American Water Softener Company, Philadelphia, located west of the roundhouse, to which raw river water is delivered through an 8-in. main extended from a pumping plant, forming a part of the old engine terminal facilities. The treated water from the plant is delivered to a 300,000-gal. storage tank of the stand pipe type, from which connection is made with the service lines distributing water where needed throughout the terminal. In addition to the above, a six-inch connection has been made with city water mains to provide drinking water and auxiliary fire protection.

The tracks in the new terminal are laid entirely with 8-foot treated ties, tie plates being provided on all turnouts and curves. The rails in the running and locomotive tracks and through turnouts are 90-lb., while in the body tracks they are either 80-lb. or 90-lb. The tracks were raised on gravel or cinders and dressed with cinders. All turnouts subject to any considerable traffic, as well as the crossovers are No. 10.

Construction Problems

The preparation of the site of the yard not only necessitated the acquisition of additional property but it also entailed the wrecking of a considerable number of buildings, including some brick structures of an abandoned

A Construction View from the Top of the Power House Chimney

New roundhouse, shop buildings and stores building in the foreground and old engine terminal in the background. This view was taken before rearrangement of the yard tracks had been carried out

distillery. Enough bricks were salvaged from these buildings to provide all the bricks needed for the new terminal structures, other than face bricks. The area was also traversed by a number of streets, involving four grade crossings of main tracks. To eliminate these as well as to clear the site, two major street relocations were carried out in addition to securing the vacation of streets which had been of value only in serving property acquired. Liston avenue, which formerly crossed through the site in the vicinity of the turntable to a connection with Hillside avenue north of the coaling station, was relocated and shortened to the position indicated on the map. Owing to the greater elevation of Hillside avenue, it was possible to connect Liston avenue with it at a reasonable grade only by putting the latter on an embankment for a distance of 2,000 ft. that required 140,000 cu. yd. of filling.

West Sixth street, which formerly crossed diagonally through the site of the yard near its east end and extended westward just south of the main tracks was vacated, and in its place South Side avenue was relocated and extended for a distance of 4,000 ft. to the east and carried over the throat of the yard on a viaduct consisting of two girder spans with reinforced concrete floors.

Occupying the base of a bluff, the yard site could be developed only by extensive hillside grading, primarily excavation. The calculated quantities in excavation totaled 650,000 cu. yd., of which only a part could be used for filling within the limits of the yard or in the relocation of the main tracks of the Big Four, as well as those of the Baltimore & Ohio which was carried out by the former under an agreement. A total of 200,000 cu. yd. was handled by trains for use in making two changes of line on the two railroads. One of these, one mile west of the yard, required 75,000 cu. yd. of filing and the other four miles further west, required 125,000 cu. yd. of embankment.

Excavation Difficulties

Excavation for the site of the roundhouse disturbed the stability of the whole hillside for a length of 2,000 ft., and resulted in a slow but persistent slide that continued for a long time and was the cause of extraordinary difficulties. It required the handling of 210,000 cu. yd. of material in excess of the estimated quantities, of which, however, only 30,000 cu. yd. was represented by the surplus material removed from the cut in the yard, the other 170,000 cu. yd. embracing material excavated from the slope north of Hillside avenue for the purpose of relieving the load and restoring the bluff side to a condition of stability.

Work on this improvement was started in May, 1926, and completed in June of present year. The project was carried on under the direction of Hadley Baldwin, chief Engineer and W. S. Burnett, chief engineer of construction. E. A. Humphreys and P. C. Clemons were resident engineers in direct charge at Riverside. The Walsh Construction Company, Davenport, Iowa, had the contract for the grading and the buildings were constructed by the Austin Company, Cleveland, Ohio.

FRISCO UP TO DATE.—In keeping with the modern vogue of the use of colors in industry, the St. Louis-San Francisco has painted two locomotives, running between St. Louis, Mo., and Springfield, Pullman green, and has striped and lettered them with gold leaf. The cylinder and valve head castings are nickel-plated. The locomotives, which were recently modernized at the Frisco's west shops at Springfield, are of the 4-4-0 type with 69-in. driving wheels and are oil-burning.

N. & W. Efficiency Meeting

THE Norfolk & Western held its ninth annual System Efficiency Meeting at the Hotel Roanoke, Roanoke, Va., on October 9 and 10. More than 450 officers and employees of the railroad, representing every point on its line and every department of its organization, were in attendance.

The first day's session was addressed by Vice-Presidents B. W. Herrman and W. S. Battle, Jr., and by General Manager J. E. Crawford. In the evening there was the annual dinner at which Harry L. Gandy, executive secretary of the National Coal Association, was the principal speaker. The opening address of the second day's session was made by Joe Marshall, special representative on claim prevention of the American Railway Association, which was followed by the presentation of prepared papers by the following delegates: T. L. Brown, master mechanic, Bluefield, W. Va.; R. M. Taliaferro, agent, Lynchburg, Va.; C. P. Harris, dispatcher, Shenandoah division, Roanoke, Va.; L. B. Hurd, assistant agent, Pulaski, Va.; R. A. Nelson, trainmaster, Portsmouth, O.; C. E. Pritchett, agent, Gary, W. Va.; R. V. Conrad, chief clerk to general superintendent of transportation, Roanoke, Va. All of the papers were designed to promote discussion and the entire remainder of the session was so devoted.

The title of Mr. Brown's paper was "Why This Meeting", and in it he outlined the methods by which greater efficiency could be promoted—personal contacts between officers and employees, better understanding between departments, information of an educational nature, and stimulation of interest in the conduct of the business of the railroad. Mr. Taliaferro outlined briefly the history of the Norfolk & Western and the remarkable development which had taken place in its territory because of the service which it had been able to render. Other speakers outlined the necessity for continued improvement in the service to patrons, conservation of fuel and railroad materials, the improvement in the character of railroad men, the importance of employees interesting themselves in their work and the responsibility of the individual in advancing the interests of the company. Railroad service appears to the patron as a unified whole. If any one individual in the whole transaction falls down in the performance of his task, the patron's idea of the company's service suffers, even though every other employee in the transaction has done his work well.

Said Mr. Harris: "We may not have informed ourselves as we should regarding the duties of our particular job. We may not be giving proper attention to the inspection of equipment, which plays an important part in the sum total of claim payments. We may not have been as careful as we might have been in receipting for shipments; to see that they are in proper shape and properly marked. We may not have been giving weights, classifications and rates the attention that we should, causing numerous errors, resulting in over or undercharges, dissatisfaction to patrons, and additional work for ourselves and the various departments in the general office. We may not be stowing less than car load freight so that it will reach its destination in good order. Remember that good service demands that good records be kept, records that will stand the test of time and be intelligible to an investigator after we have passed."

On the character of employees, Mr. Nelson said: "And, as we enter into a discussion of human element in our transportation personnel we cannot overlook the

present-day characteristics of employees. Not only has the railway advanced in the installation of modern facilities, but the railroad man himself has progressed, having become more proficient in every respect. Heavier power and equipment has resulted in the development of more skilled mechanics, while the track man has learned to maintain a better right-of-way made necessary by the increase in the weight and tractive effort of the engines and the size of the trains handled. The intelligence of the train and enginemen has advanced in keeping with the development of our engines and trains. Railway problems have been extended in every respect, which of course has taught all departments the necessity of greater efficiency. Therefore, it must be conceded that the moral standing of these 30,000 members of the Norfolk & Western family has been decidedly increased as compared with that of a decade ago. Especially so, in the ranks of our train and enginemen. The Norfolk & Western today has no place for the boomer."

Mr. Conrad, in his paper, stressed the importance of continued improvement in railroad service and efficiency due to the high degree of competition now prevailing from other methods of transportation. "The railroad with the best and most economical service," he said, "and which attracts to its territory further growth of population and industry, will be least affected by such decline. Further progress is essential to secure for our railroad the greatest possible part of the available traffic."

Procedure Under Barge Line Act Argued

WASHINGTON, D. C.

THE question as to whether the Interstate Commerce Commission is required, by the latest amendment to the law relating to the operation of government barge lines on the Mississippi and other rivers, to issue orders for the establishment of joint through rates and routes via rail and barge lines, prescribing divisions and fixing the differentials of the joint rates under the all-rail rates, without a public hearing in advance, was argued before the Commission on October 12. The commission had called on interested parties for their views as to the meaning and purpose of the amendment to the Inland Waterways Corporation act, of May 29, 1928, and also with respect to the procedure which should be followed by the commission thereunder, particularly with reference to the question of hearings.

Waterway advocates took the position that the purpose of the law was to avoid the delays that have been experienced in the past, in connection with negotiations between the barge line and the railways for the establishment of joint traffic arrangements, followed by proceedings before the commission, and that Congress contemplated a summary procedure before the commission, with protection of the railroads' rights by provision for a hearing later. Alfred P. Thom, general counsel of the Association of Railway Executives, told the commission that if that is the intent of the law it is unconstitutional but that it can be given a constitutional interpretation if the references in it to provisions of the interstate commerce act are considered as requiring the hearings in advance thus provided for.

Representative E. E. Denison, of Illinois, who introduced the bill which resulted in the passage of the amendment to the barge line act, discussed the purpose of the law to require the railroads to co-operate in the development of inland waterway transportation and said it was hoped they would see the intent of Congress and change their attitude of opposition. Transportation will not return to the rivers, he said, unless Congress can find some quick way to compel the railroads to enter into joint traffic arrangements with the water lines.

Private capital will not engage in this form of transportation, Representative Denison said until it is assured of dependable channels, adequate terminal facilities and joint rates, and the municipalities will not invest in the new type of terminals required until they have some assurance that this form of transportation is to be placed on a permanent basis. He explained that the new law provides that any water line, including the Inland Waterways Corporation, may apply to the Interstate Commerce Commission for a certificate of public convenience and necessity after which the commission is directed to order the carriers to enter into negotiations for the establishment of joint traffic arrangements within a given time. If they fail to agree the commission is directed to issue orders prescribing rates, routes, differentials and divisions. A hearing in advance of such an order, however, he said, is not necessary, except possibly a brief hearing as to the amount of the differential, and he said that a certificate should be granted to the Inland Waterways Corporation, which has already filed its application, as a matter of course.

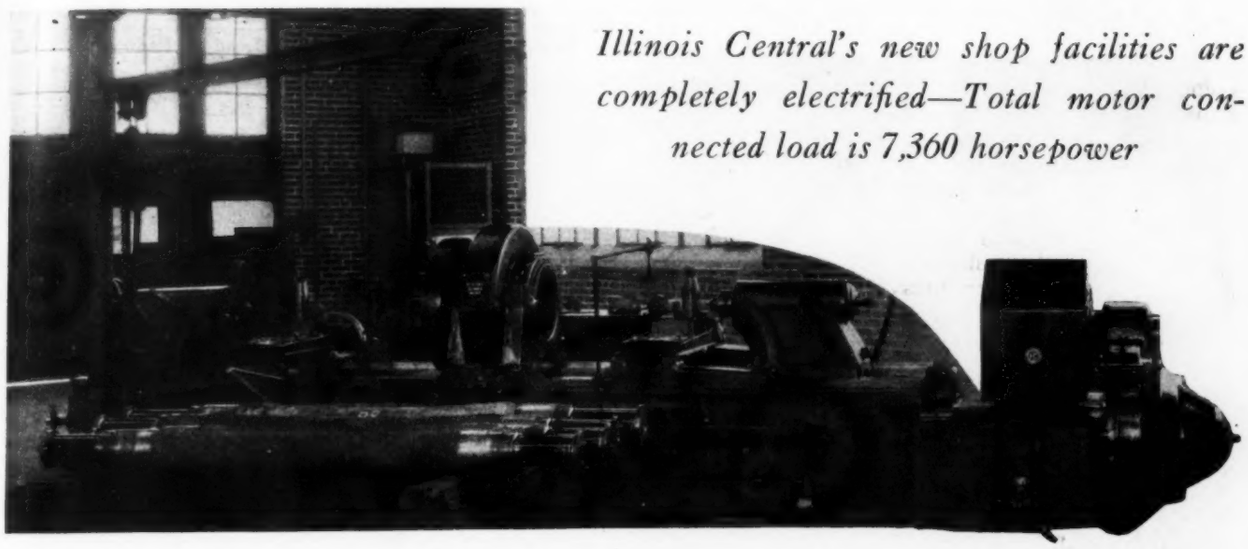
Commissioner Farrell asked if an order issued by the commission without evidence would not be subject to attack in the courts, but Mr. Denison took the position that the remedy of the railroads is preserved by the provision for a later hearing. Mr. Thom asked if he meant that there should be no hearing preceding an order following a failure of the parties to agree, but he said that if the commission cannot proceed without hearings in advance of its orders there will be the same long delays as in the past. Commissioner Eastman asked many questions as to how the commission could be expected to issue orders providing for joint rates and routes without some evidence as to the reasonableness of the routes.

Major General J. A. Hull, judge advocate general of the Army and ex-officio general counsel of the Inland Waterways Corporation, expressed the opinion that the commission need not at this time adopt special rules of procedure because the government barge line is likely to be the only applicant for some time for a certificate and orders. He said the commission should issue the certificate as a matter of course and, without hearing, issue orders directing the railroads to enter into negotiations with the barge line respecting joint traffic arrangements.

Mr. Thom quoted from statements before Congressional committees to show that proponents of the bill desired to avoid the necessity for hearings but he said that there is a distinction between the intent of the proponents and the intent of the statute itself. He cited decisions to show that such orders as are contemplated would be invalid without a full hearing as a foundation and that the law would provide for an unconstitutional delegation of legislative power unless it contained, at least by reference, some standards to govern the exercise of power by the commission. If a statute is susceptible to two interpretations, he said, it must be construed if possible in such a way as to be constitutional and the mandate to the commission can easily and properly be so construed if considered as qualified by the references to the interstate commerce act, including paragraph 3 of section 15, which requires a full hearing.

Diversified Electric Power Applications Found at Paducah Shops

Illinois Central's new shop facilities are completely electrified—Total motor connected load is 7,360 horsepower



Axle Turning Lathe with Motor and Controller at Right

AN investment of more than $250,000 is represented in the electrical equipment installed in the Illinois Central shops at Paducah, Ky.* The total motor-connected load in this thoroughly modern plant is 7,360 hp., distributed among the power house, traveling cranes, machine tools and auxiliary facilities. For driving machine tools (315 machines) a total motor-connected load of 3,625 hp., is provided, the motors ranging in capacity from 0.5 hp. to 125 hp. The 17 traveling cranes require 2,012.5 hp., in motors which range in size from 5 hp. to 80 hp. In the steam power house, the connected load is 992 hp., the largest motor being a 500-hp., 2,300-volt synchronous machine direct-connected to an air compressor. Miscellaneous electric motor applications include window sash operating mechanisms (200 hp.), jib cranes in the machine shop (159.5 hp.), vacuum heating pumps (142 hp.), and unit heaters (125 hp.) Table A lists the distribution of motors with the total horsepower rating for each.

Power Supply and Distribution

All electric power for the Paducah shops is purchased from the Kentucky Utilities Company under a contract which includes provision for both demand and energy charges. The present demand charge is $2 per kw., the energy charges tapering from 2½ cents per kwh. to 1 cent per kwh., the accounting steps in each case being 5,000 kwh. each. All power consumption in excess of 25,000 kwh. is billed at the flat rate of 1 cent per kwh. Taking the power bill for March, 1928, as typical, the effective rate, computed by dividing the total power charges by the actual kwh. consumption, is 1.92 cents per kwh.

An idea of the magnitude of the layout at Paducah can be gained from the total motor-connected load which, as already stated, is about 7,360 hp. or 5,500 kva. The peak load in March, however, was only 720 kw., indicating a demand factor of about 13.1 per cent. The average 24-hr. daily load in the winter months is about 365 kw.—an indicated load factor of 50.7 per cent. Thus 6.6 per cent of the total motor-connected load may be considered as being in 24-hr. use. The average load has been increasing regularly each month since the new shops were placed in service and it is expected that the demand will increase slowly but uniformly during the next few years. In this manner the railroad has, by purchasing power, escaped the capital charge burden on the investment in steam generating facilities which would be necessary to protect service requirements and to provide for the anticipated expansion of electrical load at the shops.

The power company's 6,900 volt substation is located at the north end of the power house, three 500-kva. transformers being mounted on a concrete platform surrounded with suitable fence protection. The incoming service of the Kentucky Utilities Company is carried in underground, terminating in sealed potheads at the switchgear installation in the basement of the power house.

Control Panel

A 23-section remote-control switchboard is located in the operating room of the power house, the right-hand panels of which control the incoming 6,900-volt, 3-phase lines. The remaining panels are for 6,900-volt and 440-volt distribution. The switchboard is noticeable particularly for its extreme simplicity which is largely due to the dead-front control feature, and partly to the fact that all of the instrument and oil circuit breaker control switches are of the rotary drum type.

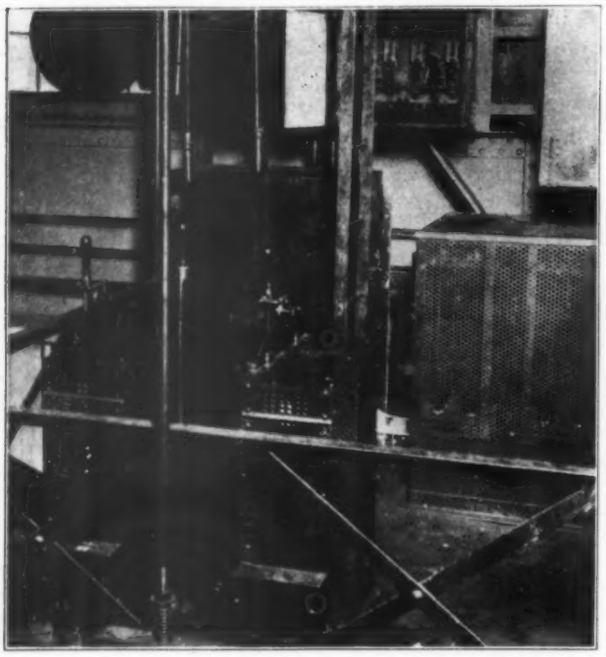
Power Plant

A building, 92 ft. by 343 ft. in plan, and with a maximum height of 83½ ft. houses the power plant. The boiler room has been equipped with two batteries

* An article describing the general engineering features of the shop buildings at Paducah, Ky., was published in the *Railway Age* of August 6, 1927, page 256.

of three boilers each, that will develop a total of 5,172 b. hp. However, space is provided for two more boilers in each battery, which, when added, will raise the boiler capacity to 8,620 b. hp. A smoke stack having an inside diameter of 12 ft. and a height of 265 ft. is provided for each battery.

The boilers are fed by automatic stokers from overhead coal bunkers which have a total capacity of 1,000



Control Cab of the 250-Ton Gap Crane in the Locomotive Erecting Bay

tons. The coal is dumped from the cars directly into a track hopper, whence it is carried by a flight conveyor to a pivoted bucket conveyor, which elevates the coal and distributes it to the bunkers. The ashes from the boilers are loaded into carts, raised by a hoist and dumped automatically into a large ash storage bin located over the adjoining tracks, from which the ashes are spouted directly into cars.

As might be expected, the largest motor at Paducah is connected to an air compressor. A 500-hp., 2,300-volt synchronous motor is direct-connected to a 3,000 cu. ft. per min. air compressor in the operating room of the power house and has a control panel nearby.

In the basement of the power house, a 1,500 gal. per min. fire pump is driven by a 150-hp. slip-ring motor, and two 100-hp. synchronous motors (80 per cent power factor) drive two three-stage centrifugal boiler feed pumps. These synchronous motor-driven boiler feed pumps supplement the steam-driven pumps, and are pressed into service when the power factor of the electric load is low. In this way they serve the dual function of correcting power factor and feeding the boiler.

The coal and ash handling system is entirely motor-driven. The coal conveyor is operated by two 5-hp. motors, the apron conveyor by two 10-hp. motors, and the reciprocating feeder by two 5-hp. motors. The ash hoist employed for loading ashes into cars is operated by a 9½-hp. motor. A 1/10-h.p. motor is employed to operate the brake on the ash hoist. A car puller driven by a 6½-hp. motor is employed for pulling cars up to the track hopper of the coal conveyor.

Including the 2,300-volt synchronous motor-driven air compressor, the total motor-connected load in the power house is approximately 995-hp. (see Table B).

Locomotive Shop Has 250-Ton Crane

The largest crane in the shop and most of the machine tools are found in the locomotive erecting shop. This building is of the transverse type and has a length of 681 ft. and a width of 245 ft. It is divided into the usual erecting, heavy machinery, and light machinery bays, having clear widths of 95 ft., 80 ft., and 65 ft., respectively. A gap crane of 250 tons capacity, operating on a runway 36 ft. above the floor of the erecting bay, and two 15-ton messenger cranes on a runway 50 ft. above the floor, comprise the traveling crane facilities in the erecting bay of the locomotive shop. This gap crane is reported to be the largest of its type ever installed in a locomotive shop. The heavy machinery bay of the locomotive shop is served by two 15-ton cranes, while the light machinery bay is equipped with monorail hoists and gib cranes.

The most interesting feature of the boiler shop is the riveting tower at the middle of the shop, covering the full width of both the erecting and machinery bays, and having a height of 88 ft. to the underside of the roof trusses. This tower, which is 165 ft. long and has an unobstructed width of 48 ft. from the floor to the roof trusses for its entire length, is served by a 25-ton crane running crosswise of the boiler shop building on runways 81 ft. above the floor. From an electrical standpoint, the novel feature of the crane is the dual control installation, by means of which the crane may be operated either by remote control from a platform on a large bull riveter located on the floor at one end of the tower, or from the control equipment in the cab of the crane. The height of the rivet tower is sufficient to allow the largest boiler to be lifted on end over the longitudinal craneway, when transferring it from one bay to the other. That is, the overhead crane can pick up the boiler on end and carry it in the vertical position over to the bull riveter where full control of the boiler can be transferred from the crane control cab to the platform control equipment of the bull riveter. A single operator has thus three-dimensional control of the position of the boiler when placed over the bull riveter. To provide the dual control facilities, it

Table A—Connected Electrical Load at Paducah Shops

Application	Number of Units	Total Motor Hp.
Machine tools	315	3,625.7 hp.
Traveling cranes	17	2,012.5 hp.
Power house	26	995.0 hp.
Window sash operators	90	200.0 hp.
Jib cranes	29	159.5 hp.
Vacuum heating pumps	9	142.0 hp.
Unit heaters	153	124.0 hp.
Portable welders, rivet heaters, babbitt melters, tire heaters, etc.	15	101.3 hp.
Total	654	7,360.0 hp.

Table B—Motors in Power House

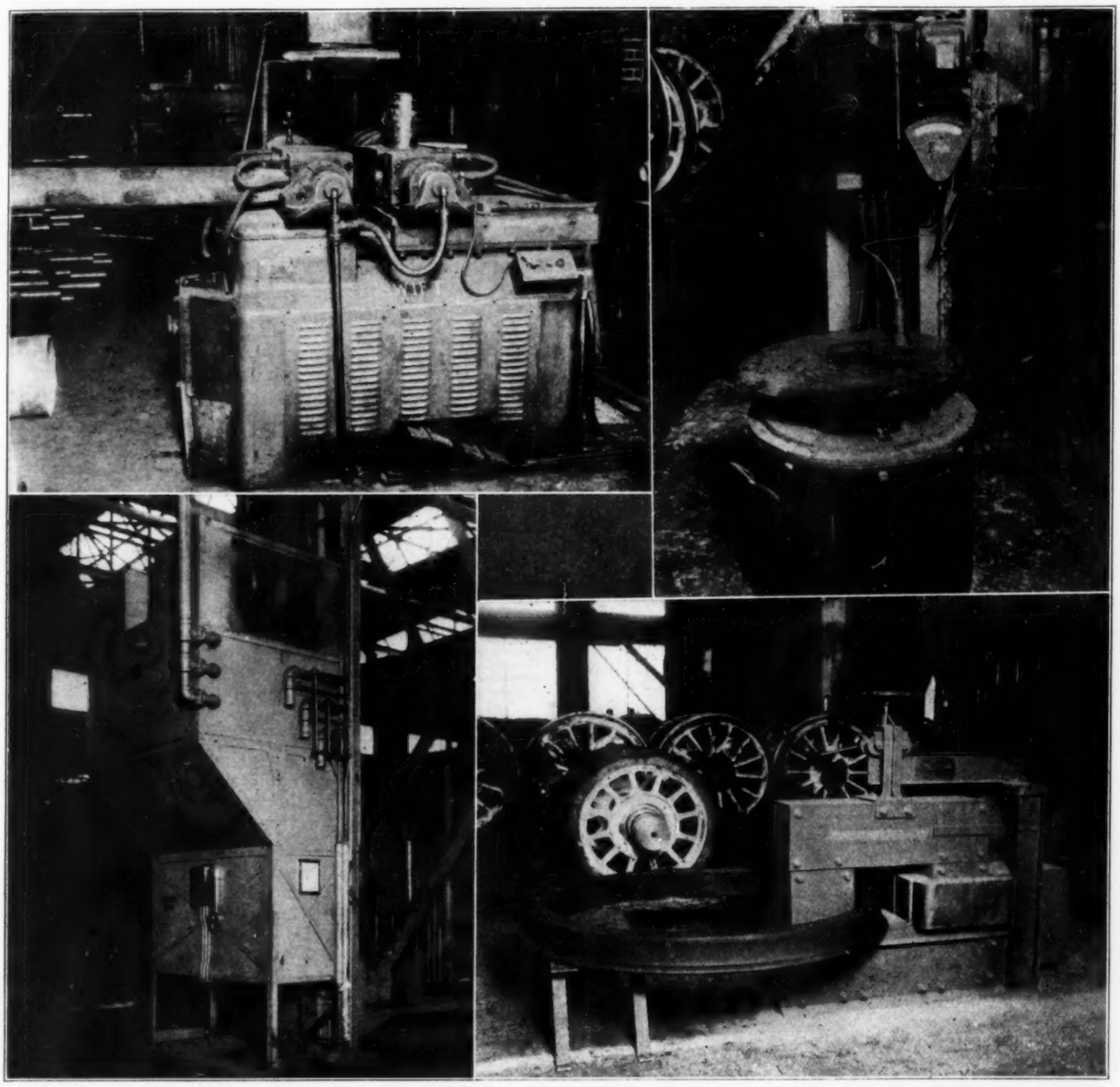
Application	Number of Units	Rating	Total Hp.
Air compressor	1	500 hp.	500 hp.
Boiler feed pumps	2	100 hp.	200 hp.
Fire pump	1	150 hp.	150 hp.
Hot-well pumps	3	15 hp.	45 hp.
Sump pumps	2	3 hp.	6 hp.
Bilge pump	1	5 hp.	5 hp.
Stokers	8	3–5 hp.	30 hp.
Apron conveyors	2	10 hp.	20 hp.
Coal conveyor	2	5 hp.	10 hp.
Reciprocating feeder	2	5 hp.	10 hp.
Ash hoist	1	9.5 hp.	9.5 hp.
Car puller	1	6.5 hp.	6.5 hp.
Total	26		992.0 hp.

was necessary to carry 23 control wires from the platform of the bull riveter to the control cab of the 25-ton overhead crane. All of the installation details of the multiple trolley wire suspension and current collecting devices were worked out by the electrical department.

Traveling Cranes

All of the 17 overhead traveling cranes at Paducah are equipped with 3-phase 440-volt, slip-ring induction motors. These cranes range in capacity from 10 tons to 250 tons, the total motor-connected loading being 2,012.5 hp. In addition, there are 29 jib cranes for handling materials in the locomotive, boiler and blacksmith shops. These range in capacity from 2 tons to 10 tons and their total motor-connected load is 159.5 hp.

Reference has already been made to some of the large cranes in the shop, notably the 250-ton gap crane in the erecting bay of the locomotive shop and the 25-ton crane in the rivet tower of the boiler shop. As shown in Table C, most of these cranes are supplied with three motors, one for operating the hoist, a second one for propelling the bridge along the craneway, and a third for propelling the trolley carrying the hoisting mechanism, backward and forward across the bridge girders of the crane. In a few instances, however, the trolley is equipped with two separate hoisting mechanisms, and in three cases, two separate trolleys (each equipped with its own hoisting and trolley motor) are employed on one crane. The large gap crane in the locomotive shop, for instance, has two 80-hp. slip-ring motors for moving the two bridges, two 35-hp. motors for operating the two trolleys and two 80-hp. motors to drive the two hoists, the total motor-connected load of this crane being 390 hp.



Upper Left—Electric Flue Welder of 150-Kva. Capacity for Safe Ending Boiler Flues; Upper Right—One of the Five 9-Kw. Babbitt Melting Pots; Lower Left—One of the Unit Heaters Employed in all Shop Buildings; Lower Right —Locomotive Tire Heater in Which Tire Forms Single-Turn Secondary of Transformer

In selecting slip-ring motors for the traveling cranes it was recognized that motors of this type did not possess the speed range which is characteristic of the series wound d-c. motor commonly applied in traveling crane service. While these a-c. cranes may not be as "lively" as the d-c type, they can be operated and maintained more economically than d-c. cranes.

Machine Tool Motors and Control

Most of the machine tools in the shop are operated by squirrel-cage induction motors, many of which are equipped with ball bearings. Where a speed range is desired slightly greater than that furnished by the squirrel-cage motor, the slip-ring type is used. Where still greater speed control is desired, direct-current motors are used. This is limited to the planers and frame slotters in the locomotive shop. The motors on planers must have a speed range of from 500 to 1,500 r.p.m., depending upon the material handled in the machine, and complete reversal of the motor is required at the end of the stroke of the table. The d-c. reversing motor planer drive has proved satisfactory.

Table C—A-C. Motor Data—Traveling Cranes at Paducah Shops

	No.	Rating	Bridge	Trolley	Hoist	Total Hp.
Locomotive shop	1	250 ton	(2) 80 hp.	(2) 35 hp.	(2) 80 hp.	390 hp.
	4	15 ton	(1) 40 hp.	(1) 5 hp.	(1) 40 hp.	340 hp.
Boiler shop		75 ton	(1) 85 hp.	(2) 15 hp.	(2) 40 hp.	
(Auxiliary hoists)	1				(2) 40 hp.	275 hp.
	2	15 ton	(1) 30 hp.	(1) 10 hp.	(1) 40 hp.	160 hp.
(Dual control)	1	25 ton	(1) 15 hp.	(1) 10 hp.	(1) 30 hp.	55 hp.
Paint and tank shop		50 ton	(1) 60 hp.	(2) 10 hp.	(2) 60 hp.	280 hp.
(Auxiliary hoists)	1				(2) 40 hp.	
Blacksmith shop	1	10 ton	(1) 30 hp.	(1) 5 hp.	(1) 40 hp.	75 hp.
Power house	1	10 ton	(1) 10 hp.	man	(1) 15 hp.	25 hp.
Iron shed	1	10 ton	(1) 30 hp.	(1) 5 hp.	(1) 40 hp.	75 hp.
Outdoor cranes:						
North and south	2	20 ton	(1) 40 hp.	(1) 15 hp.	(1) 50 hp.	210 hp.
East and west	1	20 ton	(1) 30 hp.	(1) 7½ hp.	(1) 60 hp.	97½ hp.
Lye-vat crane	1	10 ton	(1) 10 hp.	(1) 5 hp.	(1) 15 hp.	30 hp.
Total	17					2,012½ hp.

Ninety-Inch Driving Wheel Lathe

Another application of motor control at Paducah shops, which emphasizes the flexibility of electrical control in meeting the particular demands of railway work, is that for driving wheel lathes. An electric drive has been developed especially for these machine tools which are used for turning down tires for locomotives. In work of this sort hard spots are frequently encountered on the periphery of a wheel. These hard spots require a low cutting speed to save the tool, while the softer parts should be cut at a faster speed in order to obtain economical production. When a hard spot approaches the tool the operator can reduce the speed of the lathe about one-half by means of a push button, and after the hard spot has passed, the normal speed can be resumed until the hard spot again reaches the tool. In this way production is increased and tool breakage is reduced. The start, stop and slow-speed control buttons are so placed that the operator can easily reach them from his normal position, thus materially reducing the time required for set-up.

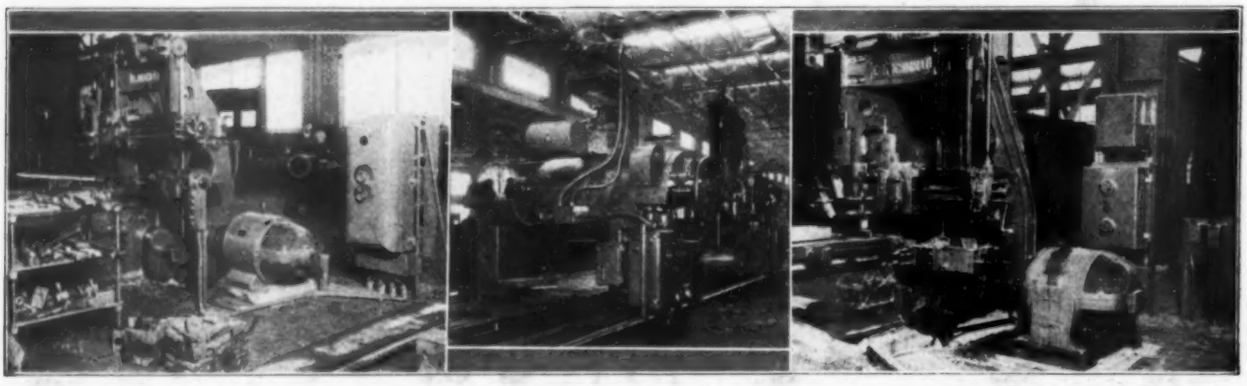
The motor may be started or stopped from either of the "start and stop" push buttons. It will automatically accelerate to full speed, and run at that speed until one of the "slow-down" buttons is operated. This causes all of the resistance to be inserted in the rotor circuit, and causes the motor to slow down to about half speed. As soon as the button is released, the motor automatically accelerates to full speed. In case of an emergency the tool may be backed off by operating the reversing knife switch on the panel and then starting the equipment in the usual way.

Twenty-Foot Plate Bending Roll

In the boiler shop a wound-rotor type of induction motor is applied to a 20-ft. plate bending roll. The rolls are driven through a speed-reducing gear train by a 60-hp. motor which has been designed to secure maximum strength with weight and overall dimensions reduced to a minimum. The wound rotor is small in diameter, thus reducing the fly-wheel effect and making it especially suitable for frequent starting and stopping. A 25-hp. motor of similar type is connected to the mechanism which raises and lowers the top roll to accommodate various thicknesses of plates. A reversing drum controller with external resistor is employed for each motor.

Table D—Motor Connected Load of Machine Tools

	No. of Machines	Range in Motor Capacity	Total Hp.
Locomotive shop:			
Frame dept.	6	1 hp. to 80 hp.	179 hp.
Cylinder dept.	8	5 hp. to 20 hp.	105 hp.
General dept.	33	½ hp. to 57½ hp.	378 hp.
Bolt dept.	12	2 hp. to 25 hp.	58 hp.
Shoe and wedge dept.	3	30 hp. to 40 hp.	70 hp.
Brass dept.	11	1½ hp. to 10 hp.	51.5 hp.
Rod dept.	22	2 hp. to 75 hp.	311.5 hp.
Guide dept.	4	10 hp. to 80 hp.	115 hp.
Piston and cross head dept.	15	0.5 hp. to 20 hp.	173.5 hp.
Tool crib	2	5 hp.	10 hp.
Tool dept. (A)	32	1 hp. to 15 hp.	202.5 hp.
Motion dept.	12	2 hp. to 20 hp.	107.5 hp.
Tool dept. (B)	7	0.5 hp. to 15 hp.	48.5 hp.
Driving and truck box dept.	10	10 hp. to 30 hp.	125 hp.
Wheel and axle dept.	19	3 hp. to 60 hp.	429.2 hp.
Air brake dept.	8	1 hp. to 15 hp.	48 hp.
Erecting shop	8	5 hp.	40 hp.
Blacksmith shop	37	5 hp. to 35 hp.	206.5 hp.
Boiler shop	28	2 hp. to 85 hp.	309 hp.
Paint and tank shop	24	5 hp. to 60 hp.	327.5 hp.
Roundhouse machine shop	12	½ hp. to 15 hp.	80.5 hp.
Motor-generator sets, 2 (100-kw.)	2	125 hp.	250 hp.
Total	315		3,625.7 hp.



Left—D-C Reversing Planer Equipment (10-Hp. Motor); Center—Double-Head Locomotive Frame Slotter (D-C. Operated); Right—Frame Planer Equipped with 25-Hp. D-C. Motor

The d-c. reversing planer equipments, as used in Paducah shops, meet the requirements of maximum production with a speed range that covers the need of various metals and cutting tools. The motors in this service must be capable of accelerating and braking in the shortest practicable time. They must also commutate satisfactorily throughout the reversing cycle. A fundamental feature of the design of reversing planer equipments is the dynamic braking arrangement whereby the motor is brought to rest by operating it as a generator. The electrical energy thus generated is dissipated in an external resistance. With the dynamic brake, a positive stop is assured when the equipment is shut down during a stroke or at the end of a stroke.

Three General Electric reversing d-c. motor planer equipments are in operation: A 75-hp. equipment on an 84-in. by 36-in. by 40-ft. planer; a 50-hp. equipment on a 62-in. by 62-in. by 12-ft. planer; and a 25-hp. equipment on a 48-in. by 48-in. by 28-ft. planer. All of these equipments employ the dynamic braking system of control with emergency braking features.

Accurate "Jogging" Control

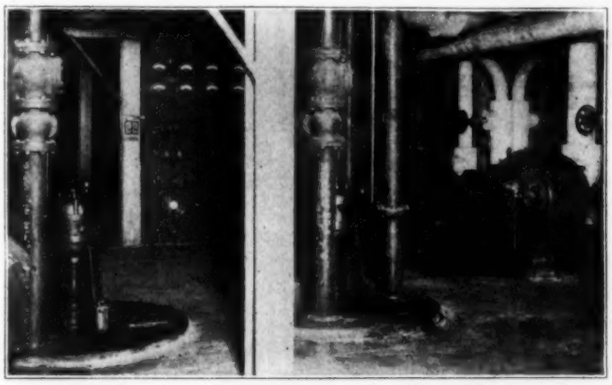
A requirement of planer operation is that, when work is being set up, it must be possible to inch or "jog" the platen. A transfer switch applied with these equipments enables such operations to be controlled from a single pendant switch on a swinging cable over the machine. Owing to the dynamic braking feature, very accurate control of the motion of the platen is possible. Both cutting and return speeds are independently adjustable to suit the character of the work in hand. Cutting speeds from 250 to 500 r.p.m., with return speeds of 500 to 1,000 r.p.m., are employed.

The Westinghouse reversing planer equipments installed at Paducah are designed especially for driving planers, draw-cut shapers, slotters, gear cutters, and similar machines, where the motor reverses with each stroke of the machine. The equipment consists of a special motor and a controller which are operated automatically by the movements of the driven machine. The motor is direct-connected to the main drive of the machine by a flexible coupling, making a positive and efficient drive.

With this equipment, the cutting speed and the return speed can be adjusted independently and within wide limits, thus permitting the use of the speed giving maximum production for all variations in length of stroke, depth of cut and feed, kind of metal and shape of tool. Furthermore, the machine is under accurate control; there is no slow-down due to belt slippage under heavy loads, and no expense for belt up-keep.

Other Shop Power Equipment

One of the noteworthy devices in the shop is a 50-kw., 440-volt locomotive tire heater. In this heater the locomotive tire comprises the secondary winding of a step-down transformer. As shown in the illustration, the upper horizontal leg of the magnetic circuit can be moved to the right to permit the crane operator to

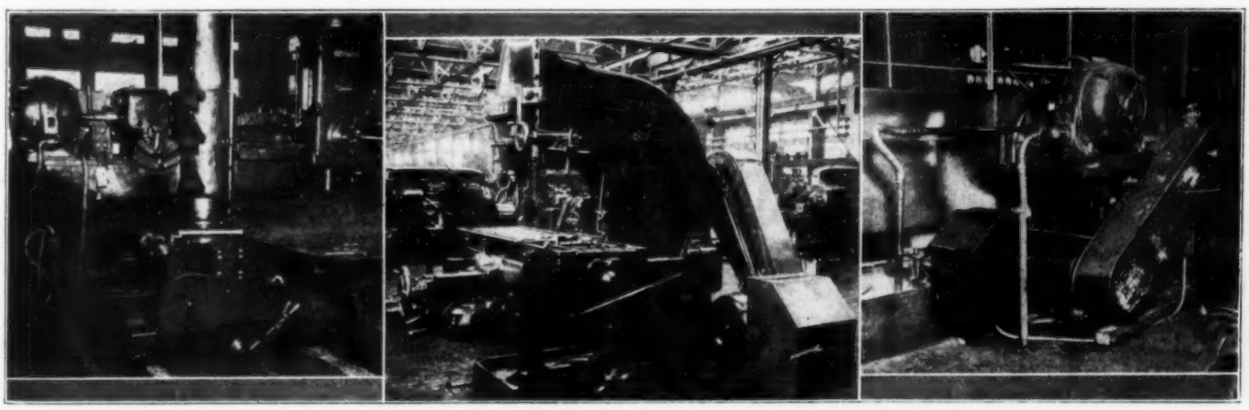


Two 100-Hp. Synchronous Motor-Driven Boiler Feed Pumps at Right and Two 15-Hp. Vertical Type Hot-Well Pumps in Foreground

place the tire in position. Between 30 min. and 40 min. are necessary to bring the tire up to the proper temperature. While this machine cannot heat a tire as quickly as an oil furnace can, the shop men prefer it because it is clean and quiet in operation.

Six electric rivet heaters of 15-kva. capacity, each having a maximum capacity of five rivets at one setting, are provided in the locomotive shop. These are portable units and are constructed along lines similar to resistance type spot welders. Each rivet is placed in the secondary circuit of a step-down transformer and is brought up to riveting temperature by the heating effect of the electric current passing through the rivet.

An electric flue welder for safe ending both steam and superheater flues is located in the flue shop. This machine is also a step-down transformer device, the welding being accomplished by the heat dissipated at the junction of the flue and safe end by the passage of the current. This flue welder is rated at 150-kva. and operates from a 3-phase, 440-volt supply. The electric heads of this flue welder are water-cooled, the



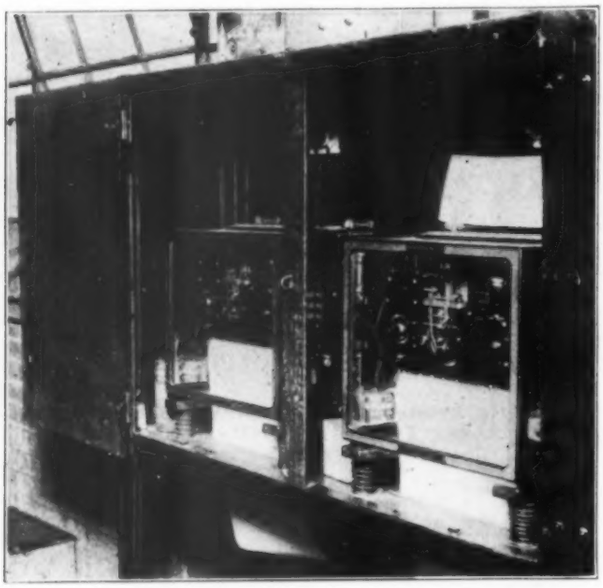
Left—Semi-Portable Radial Drill for Boiler Plates; Center—Vertical Milling Machine with 15-Hp. Motor and Automatic Control; Right—30-In. Grinding and Polishing Machine Equipped with 40-Hp. Ball Bearing Motor

circulating pump for which is driven by a 7½-hp. 440-volt motor.

Five portable electric welding outfits are used. Of these, four are rated at 300 amp. and one at 200 amp. No stationary welding equipment is provided.

Electric Babbitt Pots

Five 9-kw. electrically-heated babbitt melting pots are employed. These pots, made by the General Electric Company, have a capacity of 800 lb. of metal each,



The Electrical "Brains" of the Automatic Temperature Control Equipment for Oil Furnaces

and are heated with units of the immersion type. Each immersion heater has a capacity of 3-kw, and three units are used, making the total heating capacity per pot 9-kw. Automatic temperature control has been provided, consisting of a small enclosed panel and a control instrument with its bulb immersed in the babbitt, the bulb being protected from corrosion by a cast-iron tube. The pots operate from 110-volt circuit. The service line at the shop is 440 volts, and small transformers are used to reduce this to 110 volts.

These electric pots possess several advantages. They are clean and quiet; there is no excess heat or noxious gas; the fire hazard is greatly reduced, and the automatic control holds the temperature at the correct value, eliminating excessive dross or corrosion of the crucible as well as the possibility of overheating and thus impairing the quality of the metal. The operating cost under average conditions is little, if any, higher than with fuel-fired pots, and the advantages, which are inherent in electrically-heated devices, but unusual in this case owing to the unique design of the unit itself and its efficient application, are secured without an appreciable increase in cost.

D-C. Motor Generator Substation

To provide the direct-current service for the d-c. motors on the planers and slotters, it was necessary to install a motor-generator substation in the locomotive shop. To save space, this substation was mounted on a balcony above the tool-room between the steel columns of the main craneway. Two 125-hp. synchronous motor-generators sets are provided, each driving a 100-kw., 250-volt d-c. generator. The d-c. switchboard panels for these two motor-generator sets are located on the balcony. The 440-volt, 3-phase panels for the 125 hp. synchronous motors are on the floor below in the tool-room.

Adjoining the two motor-generator panels are seven 440-volt a-c. feeder panels with manual oil circuit breakers and ammeters. These seven panels constitute a primary distribution center for all a-c. power in the locomotive shop. The power feeders radiate from this switchboard panel to secondary distribution centers throughout the shop. At the latter points a large number of enclosed safety switches have been mounted in a group to control all of the machine tools in any particular section of the shop. This practice is in accord with the most recent trend in shop power distribution, both in railway and industrial plants. This method eliminates the need of large power distribution panels. Moreover, complete safety is assured to all operators whenever starting or stopping any machine.

Oil Furnace Temperature Control

The blacksmith shop contains a number of oil furnaces for heating forgings and for heat treating of tools. These furnaces are equipped with motor-driven blowers, and are provided with the latest type of recording temperature controllers which give complete automatic time-temperature records of each furnace. The controlling and recording instruments are actuated by thermo-couples introduced within the oil furnaces at selected points. This equipment not only records the temperature, but maintains it at the desired value by electrical control of the valves and air dampers which regulate the fuel and air used in the furnaces. The temperature chart, upon which the record is made, is 10 in. wide and is visible at all times.

Electrical Repair Shop

A thoroughly modern electric repair shop has been provided in the south end of a building, which is used jointly by the tin, pipe, air brake and electrical departments. In the winding department of the repair shop, a full complement of tools is found. The coil winding machine, the taping machine and the coil spreader are mounted on a common structural steel workbench. A portable stand is provided for rewinding small motors. The tension reel is located adjacent to the coil-winding machine. A hand-operated insulation-cutting table is located nearby. The machine tools in the repair shop comprise a vertical drill press, a shaper, a small lathe and a heavy engine lathe, all of which have individual motor drives. The work benches all have cast iron legs and sheet metal covers. An attractive office has been provided for the electrical foreman in one corner of the shop, by means of partitions which are carried the full height of the room. Creosoted wood blocks are used for flooring.

Shop Lighting Fixtures

An average illumination intensity of eight foot-candles has been attained in the machine bay of the locomotive erecting shop and of six foot-candles in the erecting bay. It has been necessary to locate all lighting reflectors at a height sufficient to clear all of the traveling cranes in the shop. The scheme of lighting and of circuit distribution is substantially the same in all of the shops, and hence that in the locomotive shop only will be described. Both 200-watt and 300-watt Mazda lamps are used, fitted in porcelain-enameled

reflectors, so mounted and secured to the roof trusses that the bases of the reflectors are flush with the undersides of the trusses. In the machine bay 18-in. RLM type reflectors are employed, and these are suspended by means of flexible connectors and short U-shaped sections of conduit secured at the other end to condulet covers. The same construction has been followed in the erecting bay except that deep bowl reflectors are used on account of the higher mounting height. In addition to these overhead lighting units, porcelain-enameled reflectors of the angle type are mounted about 20 ft. above the floor on every second column in the erecting bay. In all, there are 434 reflectors for shop illumination in the locomotive building.

Adequate provision has been made for extension cords in the locomotive inspection pits in the erecting bay. Porcelain receptacles of the flush type have been located at suitable intervals in the walls, which makes it an easy matter to plug in a portable extension cord and keeps the aisleways on either side free from cords.

A number of green signal lights are located in the erecting bay on columns below the main I-beams of the 250-ton craneway, to signal the crane operator whenever his services are desired in any part of the shop. Twenty five-watt Mazda lamps, covered with green signal caps, are used. These lamps are controlled by tumbler switches mounted below on the same column within easy reach of the men.

Yard Lighting Facilities

For general yard illumination floodlights are mounted on the shop buildings at certain points. These units are 23 in. in diameter and have aluminum housings, polished glass reflectors and either 750-watt or 1,000-watt Mazda floodlighting lamps. The principal function of these floodlights is to illuminate the roadways between the buildings. These floodlights are controlled by time clocks.

Heating and Ventilation

The unit heater system is employed in all of the shop buildings. In all, 153 unit heaters are installed and these provide an air circulation of 1,655,000 cu. ft. per min., equivalent to a direct steam radiation of 358,730 sq. ft. Three-phase, 440-volt motors drive the fans on the unit heaters and these range in capacity from ½-hp. to 1-hp., the total unit heater, connected load being 122.5-hp. The capacity of individual unit heaters ranges from 4,500 cu. ft. of air per min. to 14,000 cu. ft. per min., the higher capacity units being those which draw in the air at the bottom and circulate it out at the top in two directions. The lower capacity units are the single heaters located in the corners and ends of the buildings.

Motor-Operated Window Shutters

Effective ventilation control is secured by the aid of motor-operated window shutters for both wall and roof sash. A number of different types are installed, the motors varying from two to three horsepower in capacity, all of them, however, being 3-phase, 440-volt machines. There are 90 of these window shutting mechanisms with a total motor-connected load of nearly 200-hp. Although three different types of window shutters are installed at Paducah, their construction is essentially the same and their control is similar in many respects. The control station comprises three different push buttons, one for opening the windows, a middle button for stopping the mechanism at any point in its travel, and a third button for closing the windows. These control stations are located on the wall in about the same location as the lighting switches. Essentially a window-shutting mechanism comprises a motor, a worm gear reducing drive, a limit switch, reversing controller, chain drive, and line shafting to operate the individual rack and pinion or bell crank at each sash location.

Pipe Line Electrically Welded

An interesting feature of the steam, air and hydraulic pipe line construction is the use of electrically welded connections in place of the conventional threaded joints. The pipes thus welded electrically carry air at 110-lb. pressure, steam at 185-lb. pressure, water for hydrostatic testing purposes at 400-lb. pressure and water for the operation of hydraulic riveters at 1,600 lb. pressure. In this way, threaded ends were eliminated entirely in all pipe line runs. Where it was necessary to introduce valves and other equipment, forged steel flanges were first welded to the wrought iron pipe.

A vacuum return system is employed on the steam heating line, the vacuum and water pumps required being driven by motors. There are nine of these units, ranging in capacity from 2-hp. to 25-hp., the total motor-connected load being 142-hp. The motors in each case are 3-phase, 440-volt, squirrel-cage type with magnetic starters controlled automatically by a vacuum switch in the return line. An additional automatic control feature is provided by means of a float switch in the water tank of each pumping unit to shut off the motor if too much water should accumulate in the tank. They are an essential part of the steam heating system.

Electric Tractors and Garage

The importance attached to inter-shop transportation is indicated by the provisions for a tractor garage, 30 ft. wide by 63 ft. long, of brick construction with facilities for charging and repairing storage batteries, as well as for housing tractors and trucks serving the shop grounds. It is centrally located on the main east and west roadway and convenient to all sections.

Six electric storage battery trucks and tractors are provided. Three of these are of the crane type and are used effectively in removing and placing equipment on locomotives in the erecting shop. Two electric lift trucks are provided for the service of the store department, and a tractor-type storage battery truck is employed in connection with trailers for handling materials. These six electric trucks are supplemented by three gasoline tractors for general transportation needs, but the latter are confined exclusively to outdoor service.

The engineering work involved in planning the installation of electrical equipment for Paducah shops devolved upon the mechanical, electrical and engineering departments of the railroad. Specifications for machine tool motors and control and portable electrical equipment were prepared by Lee Robinson, shop engineer, and C. A. Shaffer, general supervisor of shop machinery and tools. F. R. Judd, engineer of buildings, had general supervision of the installation of electrical equipment for the traveling cranes, unit heaters, power house auxiliaries, vacuum heating pumps, etc. All general electrical engineering plans were prepared under the direct supervision of E. W. Jansen, electrical engineer, assisted by A. L. Chapin, assistant electrical engineer, and E. O. King, division electrical foreman at Paducah, Ky.

Combination Day and Sleeping Car

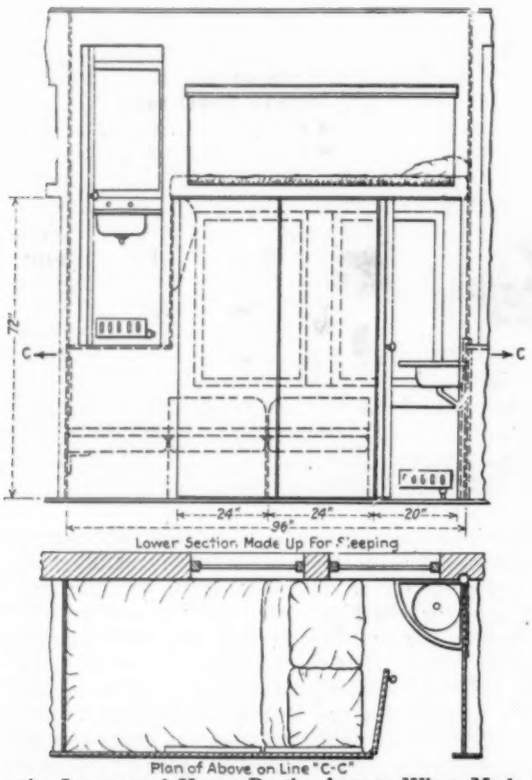
THE object of the design of the combination day and sleeping car shown in the illustration is to provide the following accommodations:

First.—Standing room in both the upper and lower berths for undressing and dressing.

Second.—Room in which to care for baggage and clothes properly.

Third.—Individual wash bowls to avoid the delays caused by the use of a common wash room.

Fourth.—Ventilation in the upper berths.



How the Lower and Upper Berths Appear When Made Up

The design provides for 32 private sleeping compartments—16 upper and 16 lower. The upper berths are not used in the day time, but can be used for lying down if the passengers so desire.

The lower compartments are used in the day time as in the present type of sleeping cars, to seat passengers of both the upper and lower compartments. To change the lower sections into berths, the back of the lower seat folds under the standing portion of the upper compartment. The back of the opposite seat is removable and is hung up in a convenient position out of the passenger's way. The remaining part of this seat is moved forward up to the other seat. A bed is thus formed on which is placed a mattress. A wash bowl on a hinge is now swung into position from the space beneath the standing portion of the next upper compartment to the right. The opening in the partition through which the bowl has to pass is closed by a panel which is attached to the bowl itself. Two movable panels and a door which, during the day, are stored in the upper compartment, are now put in place to close the lower compartment.

When the transformation is complete, the lower compartment contains a bed, standing room and a private wash bowl. It is also made private because of the two panels and the door. The upper compartment already contains an enclosed private compartment in which there is standing room, a wash bowl and a bed. A large hinged panel is provided on the aisle side of the bed to enable the porter to make up the bed more easily for night use.

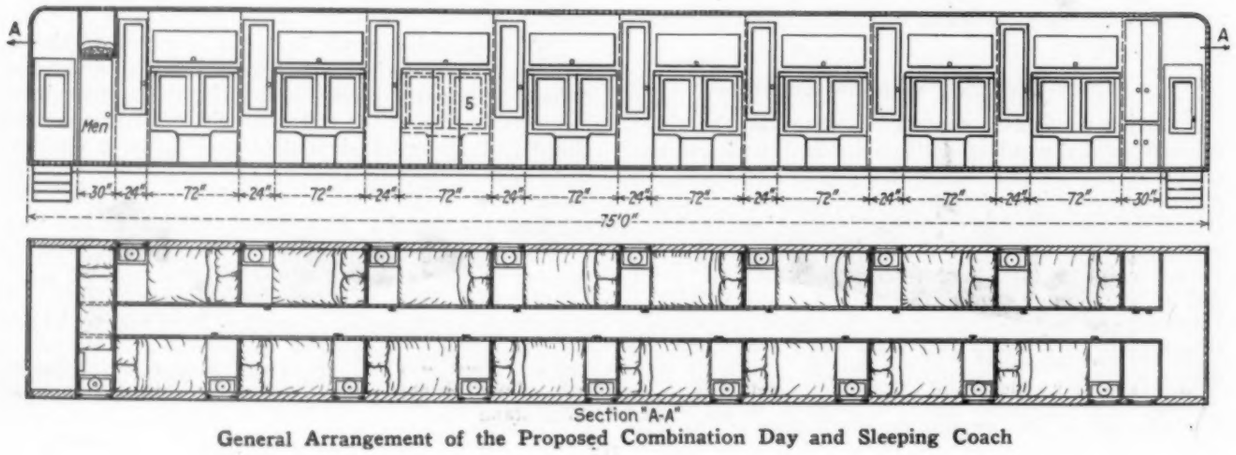
Heating and Ventilation

The upper and lower compartments are each provided with windows and individual radiators so that both air and heat can be regulated to suit the taste of the occupants.

A toilet is located at each end of the coach, one for the men and one for the women. In front of the women's toilet is a closet for the storage of linen, etc., and in front of the men's toilet is a door marked "Porter," which leads to a compartment containing a wash bowl for the porter's use. From this compartment, via a rung ladder, the porter can reach a transverse berth placed partly over the men's toilet and partly over the aisle.

The movable panels and the door used for closing the lower compartments at night are available to close these compartments in the day time if privacy is needed, or for the purpose of converting these compartments into smoking compartments. This arrangement is shown in the illustration for lower five in the sectional elevation of the car.

The patents for this design of sleeping car are held by A. E. Hutt, 5 Storer avenue, New Rochelle, N. Y.



General Arrangement of the Proposed Combination Day and Sleeping Coach

Union Pacific Gets New Coaches

Fifteen cars built by Pullman notable for length, comfort and convenience

DURING the month of September, the Union Pacific received from the Pullman Car & Manufacturing Corporation 15 modern all-steel coaches, featured by unusual length, and attractive interior decoration and equipment designed to provide the maximum of comfort and convenience for passengers.

The new Union Pacific coach is 82 ft. 11½ in. long over the buffers, being one of the longest passenger coaches ever built. It is constructed of steel throughout, including the interior finish. The roof is of the clear-story type. End vestibules are provided, equipped with modern trap doors, diaphragms, curtains, etc.

The trucks are of the six-wheel type, having Commonwealth cast steel frames, Simplex clasp brakes and rolled steel wheels. The latest Westinghouse air brake and signal equipment is provided, every precaution being taken, both in design and construction of the car, to assure the safety of the passengers.

The car has a total seating capacity of 72. The main compartment, which is about 51 ft. long, has a seating capacity of 62, and the smoking room, which is about 15 ft. long, has a seating capacity of 10. As indicated in the drawing, there is a women's lavatory equipped with a washstand, running water, mirror, towel cabinet and a small seat, also a women's toilet equipped with a flush water closet, toilet paper holder and a small seat. These facilities are located at the opposite end of the car from the smoking room.

Adjacent to the smoking room, there is provided a men's toilet with a flush water closet and toilet paper holder, and directly outside of the toilet in the smoking room is located a washstand, towel cabinet and mirror. All ot the washstands and hoppers are of solid porcelain, furnished, respectively, by the Standard Sanitary Manufacturing Company, Pittsburgh, Pa., and the Dayton Manufacturing Company, Dayton, Ohio. Disinfecting cans are provided in each toilet. Soiled towel receptacles are placed adjacent to the women's and men's wash basins.

In order to provide the maximum of comfort for passengers, particular attention has been paid to the seats and their arrangement, also to the provision of adequate heat, light and ventilation facilities.

Upper: View Showing Attractive Interior Decoration and Revolving Double Bucket Type Seats—Lower Left: Sashless Windows Are Installed; Seat Backs Have Metal Drop Coat Racks—Lower Right: Partial View of Smoking Room Showing Porcelain Washstand

Probably the most striking feature of the car is the seating arrangement and equipment. Seats in the main compartment are of the latest type, designed to rotate instead of being turned over when the direction of the car is changed. They are unusually comfortable and handsomely upholstered in a high grade blue frieze plush which harmonizes with the general color scheme of the car. Ample space has been provided between the chairs which should add to the comfort of the occupants. Ordinarily each seat is intended for the accommodation of two people, but by dropping the center arm the seat is made continuous, thus affording a more flexible seating arrangement. On the back of each seat is placed a metal drop coat rack. The backs of the seats are of the double bucket design with soft upholstering and with a well-defined division between the two seats. Two individual air spring cushion pads are placed separately on top of an auxiliary spring cushion, thus forming a deep cushion similar to that found in the best of house furniture. Well-upholstered arm rests are provided at each end of the seat. The seats are conveniently reversed by tripping a release device located on the outside of the steel base.

The seats or sofas in the smoking room are of the same general design as those used in the main compartment. However, they are made up in groups and do not rotate. They are heavily cushioned throughout and are upholstered in real leather of a brown shade to harmonize with the color scheme of the compartment. Three car sets of seats were furnished by the Haywood-Wakefield Company, Chicago, and 12 car sets by the Hale & Kilburn Company, Philadelphia, Pa.

The heating apparatus employed is of the latest type, developed by the Vapor Car Heating Company, Chicago. Automatic thermostat control is provided to assure proper temperature regulation. The floor, walls and roof of the car are heavily insulated.

Careful attention has been given to the lighting of the car, and in order to provide a thoroughly diffused light, fixtures of the semi-indirect type are employed. Manufactured by the Safety Car Heating & Lighting Company, the fixtures are arranged as follows: Each car has eight center fixtures with large opal bowls, six fixtures lighting the main portion of the car and two, the smoking room. There are four lower deck lamps with Pearla bowls, two in the passageway and one at either inside vestibule. The lavatories and washrooms are lighted by one-light bracket lamps with radiant glass shades, one also being used in the smoking room. The platform vestibules are lighted by two vestibule lamps at each end of the car.

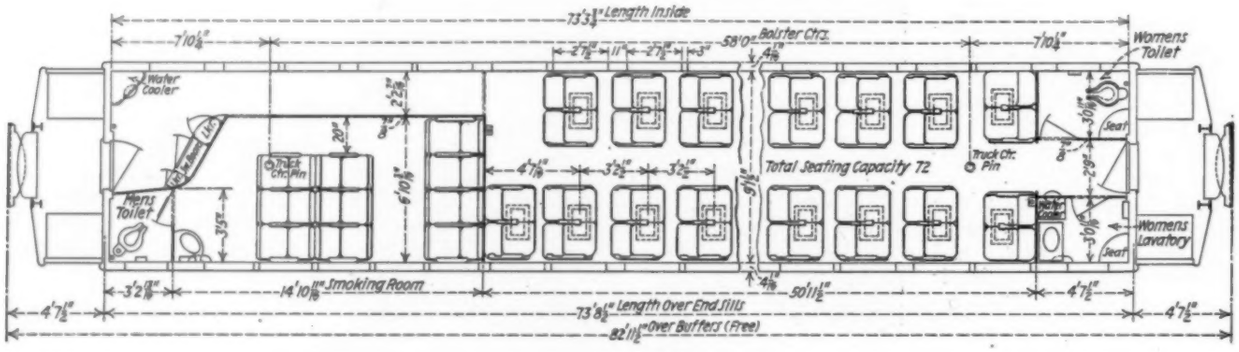
The lighting generators, also made by the Safety Car Heating & Lighting Company, are of 4-kw. capacity and of the drawn-steel magnet-frame type. The battery current and lamp voltage are controlled by the latest type regulators. The switchboards are the Union Pacific standard 6-circuit type. The storage batteries are manufactured and furnished by the Edison Storage Battery Company.

Ventilation

Proper ventilation is secured by 14 Utility induced draft ventilators located on the sides of the clear-story of the roof. Two 27-in. electric-driven paddle deck fans are provided in the main compartment and one in the smoking room, to assure ample circulation of the air and thus add to the comfort of the passengers.

Heavy sheet rubber tiling, consisting of 5-in. diagonal blocks of a special design furnished by the United States Rubber Company, Chicago, covers the entire floor of the car. The rubber tiling not only provides a well cushioned footing, but also acts as an insulator, and provides an excellent sound-deadening feature.

Another attractive and novel feature of these cars is a new type of window construction, in which the ordinary wooden sashes are replaced by sashless windows operating in felt runways, as furnished by the National Lock Washer Company, Newark, N. J. The outside and inside panes of polished plate glass are mounted in aluminum bottom rails, which carry conveniently arranged locks and lifts. The glass tracks in felt runways at the sides of the window and the top and bottom of the window is also thoroughly weatherproofed by felt packing. This window construction provides maximum vision, and the operation of the glass within the felt insures against the sticking of the window, which has been found very objectionable in connection with wooden sash. This window is designed to be weather, dust, draft and rattle proof, features sure to appeal to the traveling public.



Floor Plan of the Union Pacific Coaches

Four-Tone Color Scheme Employed

As a great variety of color is now being extensively used for decorating purposes, it was decided not to use the mahogany interior finish formerly employed in Union Pacific car equipment, which was somewhat sombre, but to provide a lighter and more cheerful four-tone color scheme.

The interior of the new coach is finished throughout in browns and tans, starting with a deep shade of brown for the heater pipe grilles. Between the grill and the window sill is a somewhat lighter shade of

brown. The window piers and the paneling over the windows are of the same base color, but of much less strength. The ceiling and lower deck panels are finished in a cream color.

The decorations of the side walls are dependent upon the good proportions and harmonious relations of their parts for the major scheme. However, the wall colors are enlivened by a recall of the blue upholstering and its complement of rose, for defining the paneling, and the ceiling and lower decks are properly emphasized by simple line decorations.

The window shades were especially produced to bring out further the symphony of browns, but with the recall of blue in order to be in strict coordination with the balance of the car. The hardware throughout the car, including window and curtain fixtures, seat trimmings, door trimmings, etc., are all finished in a silver effect and harmonize with and enhance the blue upholstering. The upholstering on the seats in the main compartment is frieze mohair of true blue of a pleasing intensity, over which is a festoon design.

A distinctive feature of the car is the polished black bakelite window sills, which not only add a modern touch of color to the interior of the car, but provide a material with good service value in that it retains its color and is not readily scratched or discolored.

The rubber tile floor covering is laid in alternating diagonal blocks of mottled black and golden-brown, and mottled blue and golden-brown and white. The hopper seats and covers are of ebony finish. The interior doors are of mahogany, stained brown, with narrow inner panel lines of cream color.

A. R. A. Test Laboratory Inspection Day

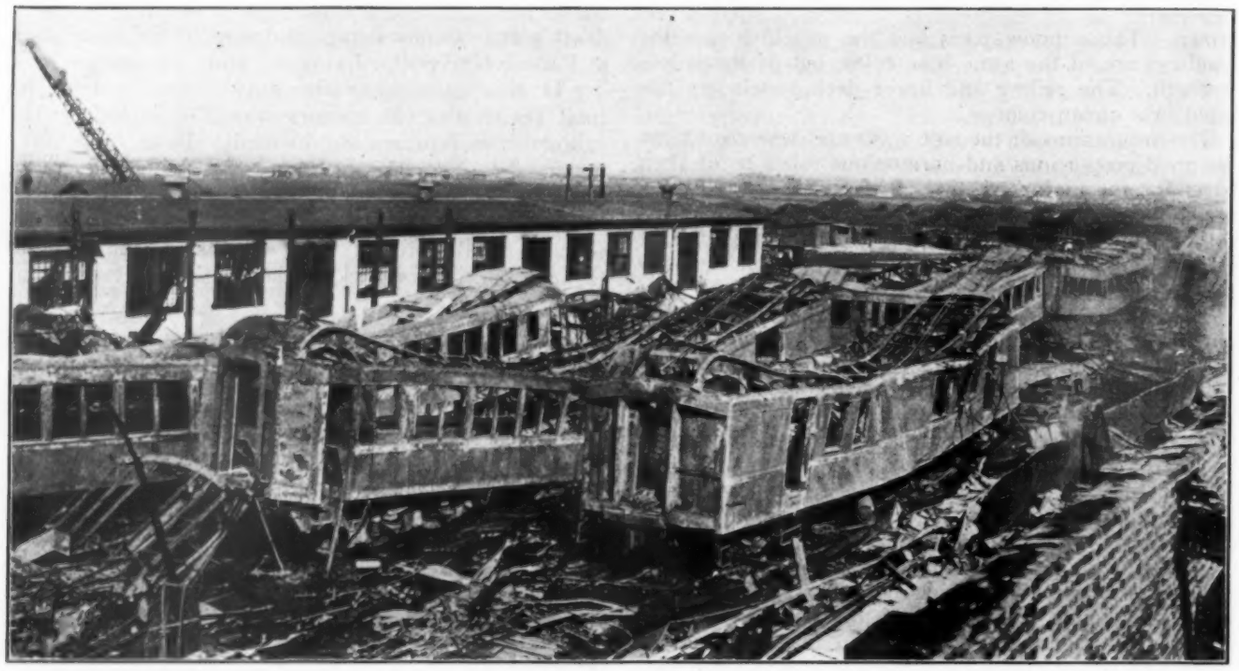
IN order to afford all members of the A. R. A. Mechanical division, and others interested, a full opportunity to familiarize themselves with the method of procedure at the air brake tests and at the draft gear tests now being conducted by the association at Purdue University, Lafayette, Ind., Thursday, October 11, was set aside as laboratory inspection day. The total registration of visitors was 204, including 114 railroad men representing 50 roads. Dean A. A. Potter and Professor G. A. Young, of Purdue University, H. A. Johnson, director of research, A. R. A., and C. A. Gray, in charge of draft gear tests, and their associates were present and conducted the visitors through the laboratories, explaining all matters of interest.

Demonstration Tests Made

Demonstration tests of draft gears were made in the A. R. A. draft gear building, both morning and afternoon, these tests being typical of those conducted in an effort to determine the draft gear characteristics essential in meeting modern operating conditions.

Twelve unofficial air brake tests were made of the Westinghouse Type FC-3 freight train equipment, submitted to the American Railway Association to further their investigation in determining "what improved appliances or devices are available for use and what improvements in power brakes and appliances were made or should be made to the end that increased safety in train operation may obtain." Eight of the tests, assuming level road conditions, were made, including: Service application followed by release; service application graduating test followed by release; straight-away emergency application; emergency following a full service application; emergency following release after service application; angle-cock test; over-reduction tion test. Four tests assuming grade conditions were made including: Cycling test with 70 lb. brake pipe pressure and release control valves set at low-pressure position; cycling test with 70 lb. brake pipe pressure and release control valves set at low-pressure position; cycling test with 90 lb. brake pipe pressure and release control valves set at high-pressure position; cycling test with 90 lb. brake pipe pressure and release control valves set at high-pressure position.

Part of the Group of 204 Railroad Representatives and Other Visitors at the A. R. A. Air Brake and Draft Gear Test Laboratories, Purdue University, October 11



After the Fire in a Coach Repair Shop

Fire Protection Association Analyzes Problems

Fifteenth annual meeting, held at Cincinnati, Ohio, attended by over 150 representatives

THE loss due to fires on railroad property during 1927 was equivalent to $1,000 per fire, according to statistics presented at the fifteenth annual meeting of the Railway Fire Protection Association at the Gibson hotel, Cincinnati, Ohio, on October 9 to 11. The meeting, which was attended by 150 representatives of the railroads, was presided over by President W. H. Klinsick, fire prevention engineer of the Chicago Burlington & Quincy, who measured the achievements of the Association by comparing the membership of 38 representing 33 railroads in 1913 with 191 active members now representing 97 railroads, 4 honorary members and 101 associate members, or a total of 296.

The officers elected for the ensuing year are: President, F. R. Bradford, supervisor of fire protection and safety agent of the Boston & Maine; vice-president, E. Moore, insurance commissioner of the Canadian Pacific; and secretary-treasurer, re-elected, R. R. Hackett, chief inspector of the Baltimore & Ohio.

President's Remarks

The president, in his opening remarks, outlined several of the activities in which the Association participated during the past year. He spoke in part as follows:

"During the past year a feature, which has been of great importance, in the work of the Association, is the section meetings. The Eastern section met in New York on January 17 and June 12 and the Southern section at Atlanta, Ga., on February 21. I sincerely hope that in the near future a Western section will be organized for I feel assured that such a section will produce as good results as the Eastern and Southern sections. These sectional meetings bring out new subjects to be considered at our annual conventions; they give the field engineers and inspectors a chance to discuss various problems with which they are confronted. These meetings also tend to arouse interest among the local officers and fire protection organizations attending as guests.

"Your executive officers have formed contact with the Motor Transport division of the American Railway Association; the Committee on Shop Construction of the Equipment Painting section of Division V, Mechanical, of the American Railway Association; A. R. A., Division VI, Purchases and Stores, Committee on the Preparation of Fire Protection Rules for Store Department Properties; and the American Railway Engineering Association, Committee on Rules and Organization, having in hand the preparation of fire prevention rules for railroad terminals.

"During President Giles' administration, the National Fire Protection Association, through its secretary, Mr. Wentworth, and its chief engineer, Mr. Rugby, extended an invitation to this Association to become a section of that organization. This invitation was carefully considered by your executive committee and it was decided that the Railway Fire Protection Associ-

ation would change its membership in the National Fire Protection Association from an associate member to an organization member.

"At the present time, there exists keen competition between the railroads and other transportation agencies and it is necessary for the railroads to curtail all needless expenditures and to effect every economy possible. The Railway Fire Protection Association has an objective which should vitally interest all railroad executives, because the Association is dealing with the preservation of property and permanency and economy of operation. Losses due to fires are a direct drain on operating revenues and, many times, the value of the structure or facility destroyed is but a small proportion of the loss sustained due to delay or loss of traffic or the increased cost of handling traffic without the facility which was destroyed. These costs must be paid out of operating revenues. Therefore, a substantial saving can be made by the railroads, if the executive officers will give proper support to their fire prevention departments in eliminating this needless loss.

"In addition to the use of superior construction in their buildings, the railroads can do a great deal in reducing the heavy drain on their operating revenues caused by fire, if they will insist on frequent and periodical inspections of all of their properties and will make some officer or employee responsible for the conditions existing in each building or group of buildings, to see that they are kept free of fire hazards. A great deal can also be accomplished by installing adequate fire extinguishing apparatus so as to be able to extinguish a fire before it gets beyond its incipient stage and by educating all employees with regard to fire prevention and securing their co-operation in the elimination of fire hazards."

Most Fires in Rolling Stock

This year the statistical committee, when preparing its report, sent revised forms to the railroads since in the past, losses sustained by the carriers have been divided into 31 causes of fires and 26 classes of risks and this practice does not show in what classes of risks certain causes of fires predominate or the number of fires occurring in specific classes of risks such as machine shops, blacksmith shops, power plants, storehouses, journal packing buildings, etc. In response, 44 roads, operating 123,076 miles of line, reported their fires for 1927 on the form as requested, while 5 roads operating 34,947 miles of line submitted losses which could not be used in the classified report. As the statistics for 1926 were based on the reports of 94 roads with an operated mileage of 253,278, this year's report represents only 53 per cent of the number of roads and 62 per cent of the mileage of last year.

A total of 4,283 fires, which resulted in $4,328,631 damage, were reported. By assuming that the number of fires and the amount of loss per road bears a direct relation to the mileage, it is estimated that there were approximately 6,865 fires on the railroads represented in the Association, which caused a direct loss of about $6,937,895. If this assumption is correct, there is indicated for 1927, a decrease of 1,523 or 18 per cent in the number of fires and a decrease of $330,540 or 4 5 per cent in the amount of loss, as compared with 1926 when the fires totalled 8,388 and damage $7,268,435.

From the data submitted by the roads, it was found that outside causes over which the roads have no control, including trespasser, incendiary, lightning, wreck, forest fire and grass fire, were responsible for the largest number of fires, 797, and resulted in the largest amount of damage, $1,081,127. Fires associated with power, both steam and electric locomotives and their parts and accessories, totalled 533, while the damage was $169,025. A total of 496 fires and damage amounting to $254,544, was caused by heating apparatus, while 376 fires and damage of $283,060 was caused by carelessness, such as smoking, loading hot cinders, thawing pipes and starting fires with benzine. With the exception of outside causes, occupational causes such as torch spark, hot metal on floor, spark from hot rivet, etc., resulted in the largest amount of damage, $518,561 and 219 fires.

The figures show that the larger proportion of fires occurs in the afternoon, thereby refuting the idea that the night time is the period of danger. A total of 1,382 fires were discovered by employees, 385 by outsiders and 37 by watchmen. Employees extinguished 1,310 fires, public fire departments 730, private fire brigades 186 and outsiders 68, while 295 fires burned out.

Fires in Rolling Stock

The Committee on Fire Losses in Rolling Stock reported that the total fire loss in rolling stock for the past five years was $13,158,422 and the total number of fires was 20,068, making the average loss $655.69, while for the same period the total fire loss in other property was $30,741,763 and the number of fires 22,406 or an average of $1,372. The largest fire loss in rolling stock occurs in freight cars from fires due to wrecks and exposure to fires in outside property. In cases of wrecks, the freight claim department can, by the prompt and efficient salvaging of the freight involved, help reduce the loss. An increased alertness of operating officers in moving cars away from fire areas will help to decrease exposure fires. The adoption of a standard side track agreement by all roads, making the side track owners responsible for losses occurring on their tracks, was recommended.

Fires caused by trespassers can be reduced if regulations keeping all freight car doors closed and fastened are drafted and enforced by every road. Cars stored for shopping or retirement should have their doors nailed or locked after first being swept out.

The committee also recommended increased fire protection in rolling stock. Locomotives should be equipped with pumps or ejectors and hose; while extinguishers should be installed in mail, baggage, combination, work and boarding cars and camps. This protection would be available for fires originating in these cars as well as in adjacent cars or property.

Co-operation with Other Associations

As a special representative of the Association, President Klinsick attended the open meeting of the Motor Transport division of the American Railway Association on January 25, 1928, at Chicago, and offered the services of the Association in studying the problems of reducing the fire hazards associated with the housing and operation of the equipment used in motor transport service. Although it was not definitely decided how the motor transport fire protection committee will function or what phases of work it will cover, the president was assured that due consideration will be given to the report of the Association on motor transportation, passenger and l.c.l. shipments and that the two organizations will co-operate in solving the problem.

A special committee of the Association to co-operate with the shop construction and equipment committee of the Equipment Painting Section of the A. R. A., attended the meeting of the Section at Montreal on September 11, 12 and 13, and presented an advance copy of a report prepared for the meeting at Cincinnati which it asked be incorporated in the proceedings. The Equipment Painting Section voted to add this report, which dealt with regulations on proxylin lacquers and finishes and the hazards of lacquer spraying, to the report of the section.

The Committee on the Protection of Company Materials in storehouses, material yards, etc., presented a report on the instructions, hazards and protection of this class of property. The report touched upon storehouses, oil and paint houses, lumber storage, material yards, garages, lighting, heating, power, smoking, compressed gases, inflammable liquids, fusees and torpedoes, matches, polishes, thermit, lamp black, charcoal, waste, protection of records, egress, salvaging operations and inspections.

The Committee on Fire Prevention and Protection in Modern Grain Elevators presented recommendations covering dust control, collection and removal, machinery, chokes in elevator legs, oiling, power, lighting, heating, driers, bleachers and protection.

Open Discussion

In an open discussion of field practices, attention was given to the hazards of snow sheds, electrical installations, sand-drying stoves, fire fighting brigades, night inspections and fires in tank cars loaded with gasoline. It was recommended that, insofar as possible, younger men be used as members of fire brigades, because of their alertness. On some roads no pay is connected with brigade drills while on others the form of recompense varies. One road employs an overtime proposition whereby the amount received by the individual offsets the fire insurance premium on his home.

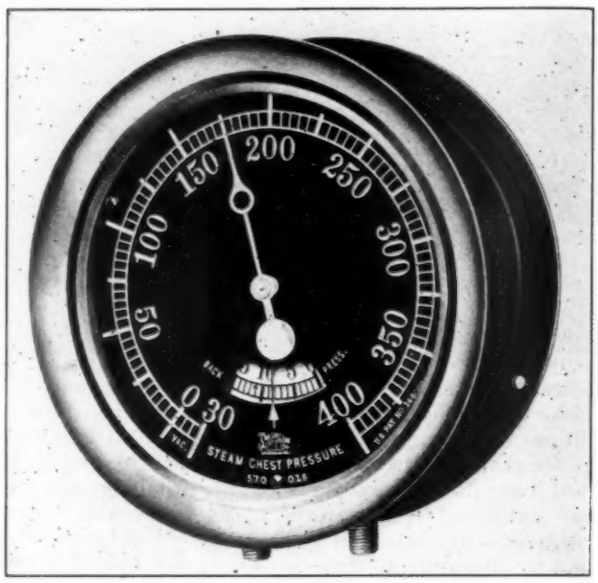
During the consideration of night inspections of railroad property by the fire protection supervisor, many cases of laxity among watchmen were described. These included the failure to travel the beat and "pulling boxes" at one point, the failure to report fire boxes that are out of order, etc. A few unexpected inspections corrected these faults and improved the efficiency of the watchmen.

A canvass of the meeting showed a preference for Toronto, Ont., for the meeting place in 1929. The selection, however, rests with the executive committee.

THE MISSOURI PACIFIC, during September, established a new high system record in the average number of cars loaded locally and received from connections daily for the 24 loading days of the month, as compared with the previous high mark in October, 1926. The total local loadings for the month were 106,278 cars and receipts from connections were 45,872 cars, a total of 152,150 cars. The average number of miles per car per day broke all previous September records with a figure of 42.85, compared with 40.60 in September last year and 41.06 last month. A new high record average for a single day was established with a figure of 50.58 on September 21. The former record of 48.34 for a single day was established on March 10, 1928. During the month of July a total of 3,254 package cars were handled out of St. Louis by the Missouri Pacific, 99 per cent of which arrived at destination on schedule, while 99.9 per cent of all of the cars were delivered within 24 hours of the published schedules.

Change Made in Ashton Back Pressure Gage

ON page 1420D57 of the June 20 Daily Edition of the *Railway Age*, appeared a description of a duplex locomotive back-pressure and vacuum gage in which the window, through which the back-pressure dial is visible, had been removed from the vertical center line to the right horizontal center line so as



The Window and the Hand Have Been so Designed That the View of Both Dials Is Unobstructed

to avoid interference or overlapping of the steam-chest-pressure gage hand. The Ashton Valve Company, 179 First street, Cambridge, Boston, Mass., has again changed the location of the window to the bottom of the vertical center line. The lower or non-indicating end of the steam-chest-pressure hand has been shortened to make it impossible for it to obstruct the view of the back-pressure dial irrespective of its position. No other changes have been made in the gage.

THE BROTHERHOOD OF MAINTENANCE OF WAY EMPLOYEES, meeting in triennial convention at Detroit, Mich., from September 8 to 21 voted in favor of the adoption of the five-day week for railway track labor.

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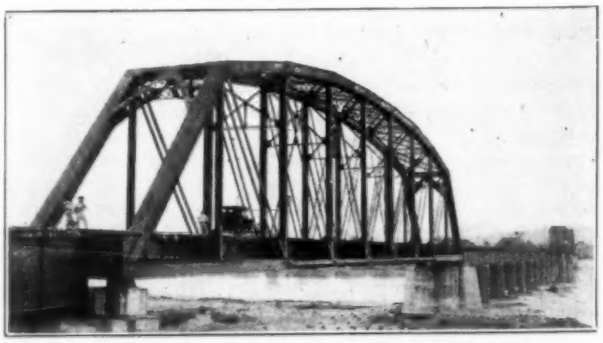


Bridge Over Culiacan River on the Southern Pacific Lines in Mexico

Transportation from the Business Man's Viewpoint*

Railway problem is primarily the problem of railway patrons —Complexities due to increase of other carriers

By L. A. Downs

President, Illinois Central Railroad

I DO not want to fall into the error of appealing to public interest and sympathy solely on behalf of the railroads, overlooking or ignoring the fact that the railroads as institutions have little or no more appeal to the public than any other private industry might have. The plea often made is "Do this for the railroads" or "Leave the railroads alone" or "Consider the needs of the railroads in this or that respect." This is all fine enough, as far as it goes, but such an appeal lacks effectiveness unless care is taken to make clear just how action taken in favor of or against the railroads will react upon the public itself.

When the Illinois Chamber of Commerce established a Transportation Committee, it did so, not out of feelings of charity toward the transportation business, but primarily because the business of the state and of its members is dependent for success upon adequate and efficient transportation. In keeping with that feeling, I come to you today, not to bring a plea from the railroads for help, but primarily to talk with you about a business which I should like for you to feel is your business rather than mine—a business which makes money for you or takes it out of your pocket, depending upon how you see fit to direct its destinies.

This is a viewpoint which every business man should find it easy to assume. Agencies of transportation in this country are virtually adjuncts of business. In the case of the railroads, for example, every business man not only depends upon their service as a patron but also passes upon their future as a citizen controlling governmental regulation and very likely profits from their earnings as a direct or indirect investor in railway securities. If, in the light of these various relationships, the railroads of the United States are not your railroads, whose are they? The same relationships will in due time, I am sure, be worked out between business men and all the other worthy forms of transportation there are, and therefore I need make no apology for referring to agencies of transportation as belonging to business men and the problems of transportation as being business men's problems.

In starting out to talk to you with such a viewpoint, I should at once recognize the fact that the transportation business has become a highly complex one in fairly recent years. For a long time, approximately half a century, the railroads alone ruled transportation affairs in this interior region. That was after the earlier form of inland waterway transportation was virtually wiped out and before highways were improved and airlines were established.

It was in that period, when railroads were virtually the sole reliance for transportation, that modern civilization in the Mid-West took form. Cities were established and attained substantial growth. Lanes of commerce were mapped out and worn into permanence by the increasing volume of traffic. The relationship between country and city, and the relative importance of the various cities, were established, largely upon the basis of the availability of railway transportation.

The simplicity of transportation which existed at the formative period of our present civilization has now given way before the advance of a variety of new forms of transportation. As you all know, there are in many cases alternatives to shipping or traveling by rail, some of them more attractive, in one way or another, than the service provided by rail. Again the detached viewpoint is of value and importance in determining their relative claims to public patronage. If I were to stand here solely as a railway man, you would undoubtedly discount what I might say about the relative values of other means of transportation, because the railroads no doubt would suffer to some extent from the success of even an economically advisable competitor; but I am not here today as a railway advocate. It is not my own interest but yours which I have set out to consider.

Even the most determined advocate of railway success, however, would not contend here, or in the presence of any other body of intelligent men, in favor of any economically improper means of transportation, even if that means were the railroad itself. I believe I am safe in saying that any railway man would be reconciled to changes in transportation, even at the expense of his own business, if those changes were proved to be economically sound and likely to redound to the lasting benefit of the nation. The railroads were the forerunners of transportation progress, and I do not believe that railway men of today are any less interested in transportation advancement as a whole. It has well been said that to hold your place in the procession you must keep constantly moving, and railway men are no exception to the rule in that respect.

As business men, however, independent of railway affiliations, you will find it to your lasting advantage to get grounded in the fundamentals of transportation and to apply them fearlessly to the problems which will present themselves from time to time. One of these problems is how to accept, how to use and how to encourage all worthy modern means of transportation.

In Illinois today, as you all know, we have a large mileage of hard-surfaced highways, and it is expanding every year. Navigable rivers form two of our borders, a lake adjoins us, and we have several canals that once were in use, besides the Lake-to-Gulf waterway that is now being improved through the heart of the state. Nearly every city of any importance has laid out an airplane landing field. We can and do ship and travel by land, water and air without touching steel rails; yet we are superimposing this new network of transportation upon the second largest state mileage of railroads in the country and we are attempting to adapt it to the needs of a rail-minded population dwelling in cities, towns and countrysides that were developed upon a railway basis.

Two points should concern us here. One is whether or not we are investing too high a proportion of our state

* From an address delivered at a luncheon of the Illinois Chamber of Commerce in Chicago on October 18.

and national wealth in the duplication of transportation facilities. The other is whether or not new means of transportation will alter the location of our present trading points and build up or tear down the cities which the railroads brought into being and nurtured.

The first question is one which should give us pause as we look into the future. It is a question which concerns us all. If we are to spend vast sums upon the development of new means of transportation, we should seek to do so wisely, upon a co-ordinated plan. We should experiment only about so far, and then, having proved the case to our own public satisfaction, we should lay down definite policies which could be followed for a considerable time to come.

The railroads have the advantages of priority in the modern field of transportation, but that fact should not be allowed to count unduly in their favor. If other means of transportation now developing can be worked in soundly to supplement or supplant them, to the greater benefit of the country, that thing should be done.

What we need is to budget our transportation expenditures. Resources are being wasted today in needless competition among different means of transportation. If we had a definite national transportation policy, as we have a definite railway policy, the country as a whole would be immensely better off. Before any railroad today can build a new line or take over one already built, it has to obtain the approval of a national regulatory body to do so; and I believe that some plan of the same sort, extended to cover not only all our interior means of transportation but even the ocean carriers in coast-to-coast service, would be a fine thing and an economical thing to undertake. The regulation of rates and of terms of competition would come afterward, and I think a national solution for those problems could be worked out also and on a basis that would determine the true economic value of each means of transportation.

The waste by duplication of transportation facilities is a problem which concerns us all, because it adds to the national transportation bill, which we all must pay in the long run, just as we all pay taxes; but the problem of readjustment of our population and our trading points is one which each locality must face for itself. No matter how it is worked out, there should be little or no loss to the country as a whole. Speaking momentarily as a railway man, I have been amazed to see the activity displayed in opposing the best interests of the railroads by communities which themselves have benefited largely as a result of railway service. Sometimes I wonder if these communities realize just what they are threatening to do to themselves.

I have taken occasion recently to point out not only the present primacy of railway service but also some of the unseen costs that are inherent in certain other means of transportation. My first contention was that the railroads will undoubtedly remain long, if not for always, the chief reliance for transportation of a country such as ours, with vast land areas remote from navigable water and with great distances and a wide variety of products demanding speed in transportation. I spoke of the limited range and high labor costs of freight transportation by truck; of the slowness and discomfort of long-distance bus travel; of the danger and limited capacity of airplanes, and of the limited territory, slow speed and climatic disadvantages of transportation by inland waterway. It is very much to be doubted, I concluded, if any one of these or any combination of them will ever supplant completely or even largely our railroads, and consequently we must accept our railroads as the basis upon which any co-ordinated system of transportation is to be built.

Concerning relative costs I asked my listeners to bear in mind the fact that railway rates and fares cover all the costs of producing the service, whereas various other prominent means of transportation benefit by governmental subsidies, if not for their equipment, at least for their rights-of-way and frequently for their terminal facilities. Twenty cents out of every dollar taken in on my own railroad last year went for the upkeep of and a return on the investment in its track structure—an expense corresponding to that which the public treasury enables buses, trucks and carriers on inland waterways to escape.

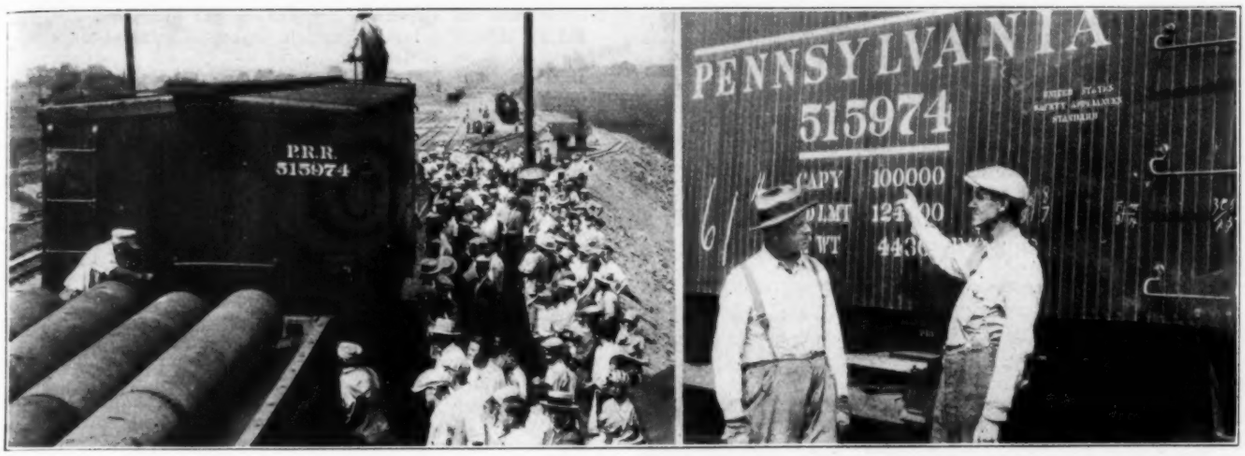
Until the government's various contributions toward the lowering of highway and inland waterway rates are included therein, I reasoned, it is hardly fair to say that such carriers are more economical means of transportation than the railroads are, and I closed by likening them to merchants who might set up to do business, rent free, in the county courthouse or the city hall.

All these points which I have just outlined I made in my capacity as president of a railroad which is seeking by every fair means to retain its place as one of the predominant carriers of the Mississippi Valley. You may feel that I have overemphasized some things and minimized others to the apparent disadvantage of competing forms of transportation; I do not believe I have, but you are at liberty, as patrons of the various types of transportation, to draw your own conclusions. In working out a co-ordinated national transportation policy, it might be well to take on behalf of each form of transportation some such summary as I have just given, weigh them together and then decide, in the light of all the facts, just what should be done in the future.

Meanwhile, I believe, it is unfair to all the factors involved to allow unregulated competition to continue indefinitely among them. I say that advisedly, not as a railway man, but as a citizen of this great commonwealth and of this great country. Our nation attained its outstanding place among the nations of the world because it became expert in transportation at a time when rapid, efficient, long-distance transportation, by the invention of the railroad, became available for its use. It is my hope that the pre-eminent efficiency of our national commerce may continue. All the railroads ask is that, if the character of their service in the past has been such as to entitle them to be known as good citizens, they may be treated as such in the future and allowed to contribute all they possibly can to the future progress of our state and our nation.

I believe it would be helpful toward a solution of transportation problems if business men would regard their agencies of transportation as being part of their own business equipment. No sales transaction is ever really complete until the goods purchased are delivered into the possession of the purchaser. The degree of efficiency with which transportation agencies function in performing that delivery service is of paramount importance to every shipper. Good merchandise, favorable prices and fair treatment help to attract customers, but their good will and patronage can be easily lost if there is not prompt, dependable delivery of their purchases in good condition.

In view of this good will feature of efficient transportation, it behooves business men to take at least as much interest in this angle of their business as in any other. This is the point which I have tried to stress to you today, and I leave it with you. The problems of transportation are more yours than mine, more yours than any one else's, and the interest you display in solving them will be just about the measure of the success attained in their solution.



A Celebration Was Held at Crestline Yard When the First Car Was Humped

Advance Planning Increases Efficiency of New Facility

Proper preparations enable Pennsylvania to obtain maximum utility from Crestline yard

THE new gravity yard of the Pennsylvania at Crestline, Ohio, was opened on August 15, with appropriate ceremonies. Within three days thereafter, the gravity yard at Fort Wayne, Ind., had been closed, so far as east and west bound business was concerned, switching expense at Chicago had been reduced and the movement of cars through the Chicago terminal district had been accelerated. As a matter of fact, within two weeks after the opening of the yard, a train of 104 cars for various connections arrived in Colehour yard of the Pennsylvania, on the southeastern outskirts of Chicago, from which point it was moved through the terminal district and delivery effected within 2 hr. 10 min. after its arrival in Colehour.

The obtaining of economies through the use of new facilities is by no means rare. The unusual feature in this case, however, is the promptness with which the operating improvements and economies were effected after the new facility was opened. It is the theory of Pennsylvania officers that a facility should begin paying for itself at once, and that, beginning with the first day's operation, increased efficiency should be shown.

In order that this would be the case with the new facilities at Crestline, much advance preparation was made. The decision to enlarge the facilities at that point was arrived at after careful study and conferences between engineering and operating department representatives. Crestline is so situated as to be the logical classification point for all trains on the northwestern general division and the present construction, while complete in itself, was built in such a manner as to fit in with possible future enlargements.

Facilities at Crestline

The work done under the present authorization consisted of moving the former westbound hump to a new and more desirable location farther west. A new receiving yard was constructed with 10 tracks of 100 to 110 cars capacity each. Sundry track changes permitted the conversion of an existing gravity classification yard into one having 3 tracks with a capacity of 100 cars each, 5 with a capacity of 60 cars each, and 4 with capacities ranging from 50 to 58 cars each. Additional repair tracks, cabin tracks, a stock car cleaning track and the necessary running tracks were also constructed. The longer tracks eliminate the necessity for doubling over in making up outbound trains, thus affecting a total saving of six train-hours per day on the average of 18 trains departing from the yard. At the same time, some changes were made in the eastbound facilities, including the construction of an eastbound hump.

Amount of Traffic

Crestline is situated on the main line of the Pennsylvania, 188 miles west of Pittsburgh and 280 miles east of Chicago. Prior to the increase in facilities there, much of the classification work was handled at Fort Wayne and Chicago. Under the new arrangement all of this work is done at Crestline, which not only permits the practical elimination of Fort Wayne as a terminal for through east and west business, but also relieves the busy Chicago terminal division. An average of 800 cars of revenue freight westbound and 700 cars eastbound is handled over the hump at Crestline daily, exclusive of the large movement of company coal, which fluctuates according to seasonal demands. Crestline is the reconsigning and storage point for the company coal supply of the northwestern general division, cars being distributed from that point to the coaling stations and power houses as needed.

After the design of the new facilities best suited to operating needs had been decided upon, and construction had been started, studies were made of proposed

operating methods. Each division and terminal superintendent involved by the changed operations was requested to submit the classifications he would recommend having made at Crestline, to facilitate the handling of cars on his division or at his terminal. The replies received, as was expected, requested approximately double the number of classifications that could be made at Crestline. However, the 28 classifications requested afforded a basis for a study of the traffic at Crestline. This study was made on the ground by representatives of the general superintendent. Using the facts developed, 15 classifications were worked out for the Crestline yard. These were made effective on the day the new yard was opened, so that, from the beginning, much confusion and lost motion was eliminated.

The Two Humps at Crestline

Many of these classifications involved cars destined to points in the complicated Chicago terminal district. It was, of course, impossible to expect that the officers and employees at Crestline would know the location of industries and the local operating problems of the Chicago terminal, 280 miles away. Accordingly, a campaign of education was conducted. Several men familiar with the various phases of operation in the Chicago terminal, with an assistant general yardmaster in charge, were sent to Crestline. Under actual operating conditions, they increased the familiarity of the Crestline staff with conditions in Chicago, so that when the revised operations began, and Crestline was called upon to relieve the Chicago terminal of much switching there would be no confusion as to the proper classification and make-up of trains destined to Chicago. Results obtained since the new facilities have been operating indicate that the relatively small expense involved in this procedure was amply justified. Yardmen at Crestline now know what the Chicago yardmen desire and there is the additional factor that such personal contact has brought about a closer acquaintanceship, productive of the maximum co-operation.

The Westbound Trains

In order that the classifications at Crestline may be better understood, it is necessary to present a resume of the class and make-up of trains entering the yard. The Pennsylvania not only schedules all of its freight trains, even including trains of empty cars, but names most of them as well. Thirteen westbound freight trains are scheduled to arrive at Crestline every 24 hours. The following is a summary of these trains:

P F 1, "Star Union Line," Enola, Pa., to Chicago, containing freight from the eastern Pennsylvania and Maryland districts.

P F 3, "The Peerless," Pitcairn, Pa., to Chicago, containing freight from the Pittsburgh district.

B E C 1, "The Excelsior," Buffalo, N. Y., to Chicago, containing freight from the Buffalo, Erie and Youngstown Districts.

N. L. 1, "The Yankee," Enola, Pa., to Chicago, containing freight from New England and from the Brooklyn docks.

T R S 1, "The Home Run," Jersey City, N. J., to Chicago, containing empty refrigerator, tank and stock cars from the New York metropolitan district.

F W 3, "The White Moth," Pitcairn, Pa., to Fort Wayne, containing freight from the Pittsburgh district for delivery to the Detroit, Toledo & Ironton at Lima, Ohio, and to the Grand Rapids & Indiana at Fort Wayne, Ind.

T R S 15, Altoona, Pa., to Crestline, containing empties from the Central Pennsylvania district.

T R S 13, Conway, Pa., to Crestline, containing empties from the Pittsburgh district.

W C 1, Mingo Junction, Ohio, to Crestline, containing freight from Weirton, W. Va., Wheeling, and Ohio Valley districts.

P F 5, Sharpsburg, Pa., to Crestline, containing freight from the Allegheny Valley district, also empty refrigerators from the Pittsburgh produce yards.

P F 7, Canton to Crestline; F W 17, Cleveland and Akron to Crestline, and "The Lily," Mansfield, Ohio, to Crestline.

All of these trains are classified merely to Crestline and all further classification is performed there.

The Classification Study

With the 28 recommended classifications as a basis, a study was made of the westbound traffic passing through Crestline on July 27, 28 and 29, before the new yard opened. Each of the above trains was analyzed and the number of cars for each of the 28 proposed classifications was set down. A study was also made of the movement through the yard by three-hour periods, to determine the relative flow of traffic at various times of the day. These studies developed interesting facts. The number of cars for some of the recommended classifications averaged as high as 87 per day, while on others, the average was only 4 or 5 per day.

Equipped with this information, the 28 classifications were reduced to 15. There are only 13 classification tracks at Crestline, but the time study developed that it was possible to use two of these tracks for separate classifications at different periods of the day, so that they would not interfere with each other. The 15 classifications finally decided upon are as follows:

1. Polk street loads and empty tank cars.
   (Downtown Chicago industrial district)
2. 55th street loads and empty tank cars.
   (Chicago central manufacturing and industrial district)
3. Clearing loads and empty tank cars.
   (Belt Ry. of Chicago interchange yard)
4. Colehour loads and empty tank cars.
   (South Chicago industrial district)
5. Indiana Harbor Belt empties.
6. Colehour and Clearing empties.
7. 55th street empties.
8. Hobart, Ind.
   (Connection with Elgin, Joliet & Eastern)
9. Plymouth, Ind.
   (Junction with branch to South Bend, Ind.)
10. Hamlet, Ind.
    (Connection with New York Central)
11. Fort Wayne house cars.
12. Fort Wayne and beyond.
    (Cars for the Grand Rapids & Indiana)
13. Nevada and beyond.
    (Local points Crestline to Fort Wayne, excluding Bucyrus and Lima, Ohio)
14. Lima, Ohio.
    (Connection with Detroit, Toledo & Ironton)
15. Bucyrus, Ohio.

Empty tank cars are handled the same as loads on the Pennsylvania. With this exception, all empties and loads to Chicago and beyond are classified separately. This avoids terminal delay to the loaded cars and also

facilitates the make-up of trains in the departure yard. The trains moving westbound out of Crestline consist, in general, either of all loads or all empties. It is only in the comparatively few cases when sufficient loaded tonnage is not available that empties are used as fill-ins, and in these cases, they are invariably blocked in one group at the head or rear of the trains for greater facility in handling at the Chicago terminals.

No attempt was made by the general officers to assign the tracks on which these classifications were to be made. The results of the time studies were turned over to the assistant trainmaster in charge of the yard. He assigns the tracks in accordance with the varying traffic conditions throughout the year which control the number of cars for the various classifications.

Eastbound cars were formerly classified at Crestline by flat switching, much of the work on these cars being done at the eastbound hump at Fort Wayne, Ind. The complete general plan for enlarged eastbound facilities at Crestline has not as yet been carried out. However, since the installation of the temporary hump, much of the classification work formerly performed at Chicago and Fort Wayne is now being done at Crestline. It has thus been possible to cease using the eastbound hump at Fort Wayne, as far as the eastbound business is concerned.

In addition, the so-called "mountain test" of air brakes is now performed in Crestline instead of at Fort Wayne as heretofore. This test is made on all through trains destined to the East, in order to insure sufficient braking power in traversing the mountainous territory east of Pittsburgh. It consists of getting a 70-lb. pressure in the brake pipe, then making a 15-lb. reduction. After three minutes have elapsed, the inspectors turn the retaining valves to normal position and, if they discharge, they are known to be in working condition. The total braking power is also computed. In good working order, two-position valves are rated at 75 tons pressure, and three-position valves at 105 tons pressure. The total number of cars equipped with two-position valves in the train is, therefore, multiplied by 75, and the number of cars with three-position valves by 105. The resulting total pressure must equal or exceed the gross tonnage before the train is assumed to have sufficient braking power for safe mountain operation.

Conclusions

The generally improved operation, effective immediately after the opening of the new facilities, is attributable entirely to the careful advance preparations and studies made. The closing of Fort Wayne yard for all but north and southbound traffic has been one result. Another excellent result has been the reduction in classification at Chicago, and the correspondingly accelerated movement through that terminal. This results in many savings, both in yard wages and expenses and per diem. In addition, the present greater knowledge of the Chicago district now possessed by the local officers and the employees at Crestline has had the result of eliminating wrong classifications for the Chicago district and avoiding back-hauls, unnecessary switching and other expensive procedures.

Railroads Complete Case Before Fact Finding Board

Two presidents and eleven operating officers show restrictive effect of double-header rule

THE second week of the taking of evidence by the emergency fact finding board, appointed by President Coolidge to investigate the controversy over wages and certain operating rules between 57 western railways and their 47,000 conductors and trainmen, closed with the completion of presentation of testimony by the carriers in support of elimination of the double-header rule. The brotherhoods—the Brotherhood of Railroad Trainmen and the Order of Railway Conductors—began their rebuttal testimony on October 15 and the board allowed the Chicago Association of Commerce and the Illinois Manufacturers Association to present the case for the public on the following day.

J. W. Higgins, chairman of the Conference Committee of Managers of the Western Railways, presented a statement tracing the negotiations for increased wages carried on by the employees from the time of the arbitration award of March 1, 1927, which granted a portion of the two Brotherhoods—the yardmen—a 6.5-per cent increase in wages. During the direct examination of Mr. Higgins by K. F. Burgess, general solicitor of the Chicago, Burlington & Quincy, and cross examination by E. P. Curtis, president of the conductors, and A. F. Whitney, president of the trainmen, the proposals and counter proposals by each side were recounted in detail. Previously the board had been supplied with a complete file of correspondence passing between the two parties since July, 1928.

Trainmen's Earnings Greatest in West

"Throughout 1927, every month that year and so far this year, the earnings of freight road men, West, have exceeded those of like men in the East and South despite the 7.5 per cent increase in basic rates made in the East and South in 1926 and 1927," Mr. Higgins said. "On the whole, western trainmen have always had more favorable rules than in other sections. Many of those rules also apply to the engineers and firemen. But separate and apart from all other rules, there exists in the West the double-header rule. This rule exists on western railroads only. It is in the wage schedules of the conductors and trainmen only. It affects no other men except a small number in the through freight class. The whole number of men in the through freight class is but 28 per cent of all the men affected in this dispute."

The rule generally in effect in the West prohibits double-heading with trains of over 40 cars, exclusive of cabooses, except where the rating of one of the locomotives is great enough to handle the train alone, and in case

of accident or emergencies, he stated. It is usually provided that requests for helper service at particular points may be settled by negotiations between the management and the employees.

Mr. Higgins traced the history of this rule and testified as to the manner of its inclusion in wage schedules in 1903 by strike threats. After securing strike votes on the Missouri Pacific, the Missouri-Kansas-Texas, the St. Louis-San Francisco and the St. Louis Southwestern, the organization leaders gave each of these roads 24 hours to agree to abolish double-heading. Mr. Higgins read from testimony before the conference with the eastern railroads in 1913. Mr. Garretson, then head of the conductors, described the process at that time as follows: "We squeezed the Missouri Pacific for settlement at 10 o'clock on a certain morning. On the next morning at 10 o'clock the Katy made a settlement. The next day the Frisco at the same hour and the next day the Cotton Belt came across. Then we went the rounds. Bear in mind that none of these roads were excessive double-header roads. The Santa Fe was the chief offender. From there we jumped to the Santa Fe and the moral wine press got turned very good and hard before they came over."

"The railroads object to this double-header rule because it limits the number of cars and tons in the shorter freight trains," Mr. Higgins continued.

"This rule produces waste by preventing the use of the full power of two locomotives on one short freight train. It creates positions for both trainmen and enginemen that are not needed at all. Its only purpose is to limit the number of cars in a train where two engines are used. It is archaic and is contrary to the economic views which are, I think, universally accepted in this country.

"Solely because the western engineers and firemen had received wage increases of 6.5 per cent through the workings of the Railway Labor Act, we offered this same increase, without demanding any changes in rules, to the conductors and trainmen. We offered to give them $6,500,000 a year, while they retained the double-header rule which is wasting about $1,500,000 a year. They refused.

"Then we offered to give them a 7.5-per cent wage increase if they would eliminate the double-header rule. This second proposition would give them $7,500,000 a year, with all their present rules except the double-header rule which is wasting $1,500,000 yearly. In other words, we said: 'Give us an opportunity to save the $1,500,000 now being wasted and we will give you $1,000,000 of it in wages.' Again the men refused.

"We next proposed arbitration of the difference and were met by a third refusal. Finally, the so-called 'Washington agreement,' which provided for a 7.5 per cent wage increase, $2,500,000 in back pay, and left the double-header rule to be decided on the individual railroads in specific cases by conference, mediation or arbitration between the individual managements and their own men. This was also rejected by the employees. We feel that there has not been a thing in the entire proceedings at any time to even remotely give cause for a strike vote or to warrant the rejection by these organizations of the principle of arbitration. We feel that their attitude threatens the life of the Railway Labor Act which was designed to peaceably adjust the wage disputes of railway labor."

L. A. Downs, president of the Illinois Central, presented a statement on October 11 in which he declared that except for increased train tonnage and other operating improvements and economies, the railroads of this country either would be in bankruptcy or would have to receive greatly increased revenues from the public in order to avoid bankruptcy. He told the board how the railroads have made extensive improvements to equipment and facilities, amounting to almost complete rebuilding of their plants, to permit the operation of heavier trains.

"If from 1903 to 1926 there had been no increase in the load carried by the average freight train, the expenses of handling the actual traffic of 1926 would have been increased by more than $1,440,000,000," he continued. "Had there been no change, the additional expenses in 1926 would not only have wiped out the entire net earnings in 1926 but would also have resulted in a deficit of $212,000,000 before considering the payment of fixed charges.

"Statistics contradict the supposition that lengthening freight trains produces greater hazard of injury. Increasing the number of cars in freight trains means that fewer trains are required to handle the traffic. When the number of trains is decreased the possibility of accidents is likewise decreased. The operation of more, shorter trains would greatly increase the possibilities of accidents at grade crossings."

Following Mr. Downs testimony, the railroads on that day and on October 12 called 11 operating officers—vice-presidents in charge of operation, general managers, assistant general managers and general superintendents—to testify concerning the restrictive effect of the double-header rule on their respective railroads. G. B. Vilas, general manager of the Chicago & North Western, described the sand and gravel movement on his railroad from points in southern Wisconsin and northern Illinois to Chicago, incident to the extensive road building program in Illinois and building construction in Chicago.

"The movement of the tonnage is continually increasing and the rates are very low," Mr. Vilas said. "Janesville, Wis., is an important point of origin. Between that point and Chicago, a distance of 90 miles, Mikado type locomotives with a tractive power of 60,000 lb. are able, owing to the grades encountered, to haul only 38 cars of sand and gravel from Janesville to Harvard, 30 miles, and 45 cars from the latter point to Chicago. The tonnage of the train is filled out at Harvard from the products of nearby sand and gravel pits. It would be entirely practical to haul substantially twice the tonnage of these trains by double-heading locomotives. During the period from April 1 to November 30, 1927, there were 2,290 trains of gravel operated over this line. The number could have been reduced about half by double-heading.

"This would not only be conducive to efficient and economical operation, but it would relieve congestion on this line, which is now double-tracked and over which there is handled a substantial portion of the traffic moving between Chicago and the Twin Cities, as well as intermediate Wisconsin points. A diminution in the number of trains would also reduce the hazard of grade crossing accidents in a territory where there is a tremendous automobile traffic. Special requests have been made upon the general chairmen of the conductors and trainmen to operate in this manner and have been refused. It would cost the Chicago & North Western in excess of $3,000,000 to reduce the grades on this line to 0.4 per cent so as to permit of heavy trains without the use of double-headers.

"In refusing a request of the management for permission to operate helper service between Crystal Lake and Palatine, the general chairmen of the conductors and trainmen replied as follows: 'Since receiving your letter, we have placed this matter before our respective organizations on the Wisconsin division and they advise that

they are not agreeable to establishing helper service in the district such as you propose for the reason that it would have the effect of eliminating a number of crews from the service involved without any returns to the men.'"

J. R. Hitchcock, assistant general manager of the Coast Lines of the Atchison, Topeka & Santa Fe, told of the double-header rule prohibiting the hauling of more than 2,900 tons with two locomotives on the Arizona and Albuquerque divisions between Needles, Cal., and Winslow, Ariz., 292 miles. Freight trains are now operated in both directions with two locomotives and the tonnage restriction results in a maximum train length of about 62 loaded cars. The two locomotives now operated are capable of handling from 350 to 400 additional tons on expedited schedule which could be carried in seven or eight additional cars. This is a daily loss of efficiency on nearly all eastward through freight trains. But for this restriction the Santa Fe could have handled the traffic that was actually handled during 1927 with some 373 less trains or over 54,000 less train miles.

W. E. Maxson, assistant general manager of the Gulf, Colorado & Santa Fe, stated that between Brownwood, Tex., and Temple, 131 miles, during 1926 and 1927 when the bringing in of new oil wells created a heavy movement of freight a serious congestion and wasteful operation could have been avoided had it not been for the double-header rule. The maximum tonnage was reached with 35 to 36 cars of oil and the 40 car limit under the rule prevented the necessary relief. The 472 through freight trains operated during January, 1927, could otherwise have been reduced by proper double-heading to about 236 trains of 76 cars per train.

W. E. Brooks, general superintendent of the Southern district of the Missouri Pacific, told of a similar situation on that railroad between Arkansas City, Kan., and Coffeyville, 95 miles, where 21,760 cars of oil were shipped from an oil field during 1927, and between El Dorado, Ark., and Little Rock where the movement of oil from the Eldorado-Smackover-Rainbow fields was seriously hampered by the double-header rule.

"Were it not for the 40-car limitation," Mr. Brooks continued, "a train of about 100 cars could be double-headed with 2-8-0 and 2-8-2 class engines between Alexandria, La., and Monroe, where there is a heavy grade. and a single engine could haul the train intact to East St. Louis, Ill., a distance of 511 miles. Such an arrangement would have reduced train miles between Monroe and Alexandria during May, 1928, approximately 5,800 train miles and would have avoided the necessity of reswitching the train at Monroe."

Similar Conditions Exist on Other Roads

Similar restrictive conditions were described by E. F. Rummel, assistant general manager of the eastern lines of the Chicago, Milwaukee, St. Paul & Pacific, on the Sioux City division of that railroad; by F. W. Grace, general superintendent of the Missouri-Kansas-Texas, on the Northwestern district of the Katy; by T. H. Lantry, general manager of the Northern Pacific, Lines East, on that railroad between Ellensburg, Wash., and Pasco; by F. G. Gurley, general superintendent of the Wyoming district of the Chicago, Burlington & Quincy, on that railroad between Curtis, Neb., and Elwood; by A. E. Clift, senior vice-president of the Illinois Central, on that railroad between Central City, Ky., and Louisville; by F. H. Shaeffer, general manager of the St. Louis-San Francisco, on the Frisco between Springfield, Mo., and Thayer; and by A. E. Walker, general superintendent of the Second district of the Chicago, Rock Island & Pacific, on the Rock Island between Booneville, Ark., and Haileyville, Okla.

On October 13, G. H. Warfel, assistant to the general manager of the Union Pacific, presented exhibits showing the decline in casualties among train and train service employees in road and yard service. He was followed by L. W. Baldwin, president of the Missouri Pacific, who gave testimony dealing with the adequacy of the roads offer of a 6.5-per cent wage increase and the unreasonableness of the present double-header rule. The double-header rule is an arbitrary restriction upon the right of management to achieve economical operation, Mr. Baldwin said. The only effect that it can have upon compensation of trainmen and conductors is remote, he believed.

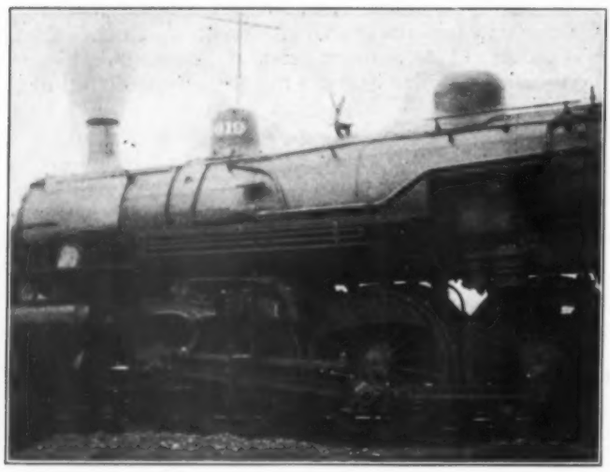
The employees called T. C. Bradley, general chairman of the conductors on the Great Northern, to the stand on October 15 to present rebuttal testimony. Under questioning by Judge Stacy, a member of the board, Mr. Bradley said that he considered it safer to operate two trains of 35 cars each with a single locomotive on each train than one train of 70 cars with two locomotives. He spoke of the possibility of the misunderstanding of signals between the locomotive and the caboose on long trains and mentioned the excessive jerks resulting from unequal application of steam in starting a double-header train. A new kind of injury has developed in the past 20 years, he said, that of nervousness or shock from jerking long trains. G. W. Hunt, general chairman of the trainmen on the Oregon Short Line, presented exhibits designed to show that decreases in freight revenues have been less in the past few years in the West than in the East or South. He also presented an exhibit showing increased productivity of trainmen and conductors.

On October 16 and 17 the board granted a hearing to a number of organizations that appeared in the interests of the public. R. C. Fulbright, representing the Chicago Association of Commerce, gave verbal notice to the railway managements that have filed applications for authority to increase freight rates because of wage increases to employees that they would be asked to prove to the Interstate Commerce Commission that their properties are economically managed. He introduced Magnus W. Alexander, president of the National Industrial Conference Board, New York, and Dr. Virgil Jordan, chief economist of that organization, who submitted results of impartial surveys of wage and living conditions of workers in railroad and other industries. James P. Haynes also appeared for the Association of Commerce. Colin C. H. Fyffe appeared for the Illinois Manufacturers' Association while M. S. Winder read a statement as executive secretary of the American Farm Bureau Federation. Mr. Whitney declared the witnesses appearing for the commercial organizations to be incompetent to testify and charged that the organizations they represented were actuated by selfish rather than public motives in appearing before the board. The brotherhoods resumed the presentation of rebuttal testimony on October 17 and called as witnesses in support of their contention that the increased length of trains has created a new hazard for trainmen, E. T. Rafferty, state legislative representative in Kansas for the trainmen, G. H. Oram, general chairman of trainmen on the Oregon Short Line, John P. Meyer, brakeman on the Sante Fe in Kansas, R. E. Kilpatrick, general chairman of conductors on the Gulf Colorado and Santa Fe, and E. L. Kratzer, local chairman of conductors on the Beardstown division of the Burlington.

It was expected that the board would close the hearing on October 19 or 20 following the completion of the employees rebuttal testimony.

New Water Treater Fits on Locomotives

APPARATUS for chemically treating boiler feedwater, that is attached directly to the locomotive, has been developed and put in use on the Chicago & North Western. This apparatus consists of a small chemical container which fits like a sleeve or drum over the boiler feedwater or branch pipe on the locomotive, next to the boiler check valve. The drum is filled with a chemical through a removable plug, and a single short tube inserted in the branch pipe is the only opening between that pipe and the drum. There are no valves or similar fittings in the system.

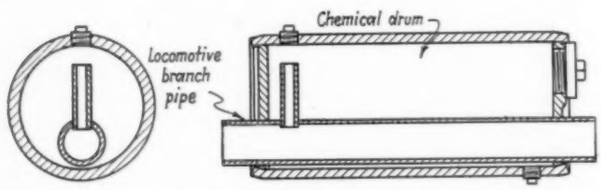


Locomotive with Branch Pipe Equipped with Water Treater

No Attention Required During Run

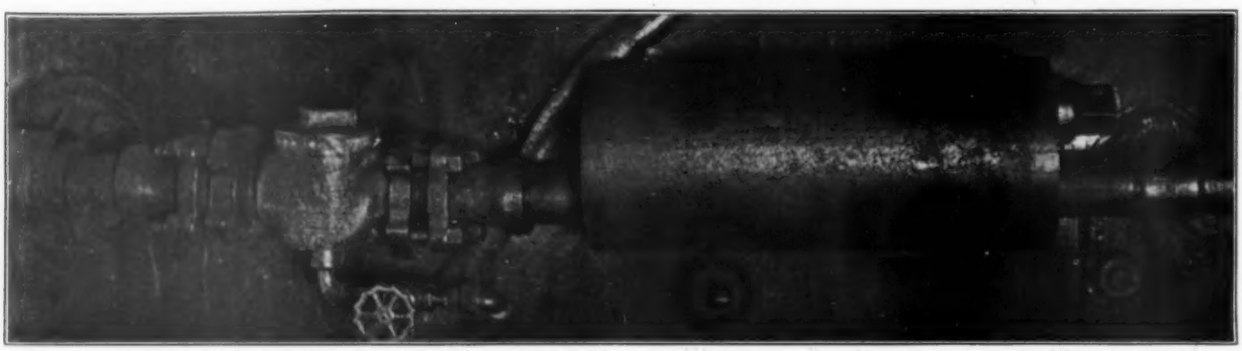
Sufficient water-treating chemical for an entire trip is put into the drum at the engine terminal and the apparatus is then ready for service, without further attention on the trip. When the injector or feedwater pump is started, a portion of the feedwater passing through the branch pipe enters the chemical drum under pressure through the connecting tube, and this water dissolves part of the chemical and compresses the air which accumulates in the drum. At each drop in pressure in the branch pipe, resulting from the pulsation of the injector or feed pump, this air expands and forces the solution into the feedwater line through which it is forced into the boiler. This flow of feedwater into the treater and back into the branch pipe with dissolved chemicals continues automatically with the operation of the injector, and ultimately discharges all of the chemical into the boiler.

The device was developed in 1924 by R. E. Coughlan, supervisor of water supply, Chicago & North Western, co-operating with the mechanical department forces, to solve a problem on the branch line between Tyler, Minn., and Astoria, S. D., where the water contains approximately fifty grains of scale-forming material, both soft and hard. The amount of water supplied at individual water stations on this line did not justify the construction of treating plants, and the introduction of boiler chemicals into the locomotive tenders was not favored because of the uncertainty of enginemen introducing the chemical each time water was taken and also because of the difficulty of keeping branch pipes and injectors from clogging with deposits before the water reached the boilers. The device was later applied to locomotives operating between Casper, Wyo., and Chadron, Neb., where the water contains an average of 20 grains of scale, and its use has since been extended until over 200 locomotives on the system are now equipped with it. It has also been applied to stationary boilers.



Sectional Views of Water Treater in Place on Feed Water Line

The kind and quantity of chemical depends in all cases upon the character of the water supplied to the locomotives. The men in charge of the boiler work are supplied with chemical testing equipment with which they make rapid tests of water taken from the boilers to determine its scaling tendency at all times, and the results of these tests are sent to the supervisor of water supply who formulates the treatment in each case. This road operates 55 water treating plants of the roadside type, which supply approximately eight million gallons of soft water to locomotives daily. Where such facilities have not been provided, this device affords an efficient method of applying internal treatment.



Water Treater on Locomotive Branch Pipe Next to Boiler Check Valve

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended October 6, amounted to 1,186,598 cars, a decrease of 10,170 cars from the total in the preceding week, due principally to smaller loading of miscellaneous freight, but an increase of 83,604 and 11,670 cars respectively as compared with the totals in the corresponding weeks of 1927 and 1926. With the exception of a falling off of a few hundred cars in the loading of livestock and less-than-carload merchandise, all commodity classification totals were larger than those of a year ago. Miscellaneous freight loading showed an increase as compared with last year of 49,623 cars and coal loading of 16,437 cars. Loading in the Pocahontas and Southern districts continued to range slightly below the corresponding week of last year but substantial increases were shown in all other districts. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, October 6, 1928

Districts	1928	1927	1926
Eastern	262,382	240,500	295,304
Allegheny	236,886	215,203	238,817
Pocahontas	61,918	62,243	62,698
Southern	162,045	162,355	167,764
Northwestern	185,159	168,782	183,798
Central Western	179,872	171,164	173,504
Southwestern	98,336	82,747	90,175
Total Western Districts	463,367	422,693	447,477
Total All Roads	1,186,598	1,102,994	1,174,928
Commodities			
Grain and Grain Products	57,592	50,022	47,534
Live Stock	38,532	38,689	40,771
Coal	207,645	191,208	221,916
Coke	10,950	9,462	13,290
Forest Products	65,655	65,034	71,090
Ore	61,407	52,482	69,631
Merchandise L.C.L.	271,193	272,096	270,964
Miscellaneous	473,624	424,001	429,732
October 6	1,186,598	1,102,994	1,174,928
September 29	1,196,768	1,126,903	1,180,049
September 22	1,143,214	1,126,402	1,175,407
September 15	1,138,312	1,127,643	1,179,259
September 8	991,042	989,799	1,024,998
Cumulative totals, 40 weeks	39,403,727	40,275,748	40,747,557

The freight car surplus averaged 103,906 cars during the period ended September 30, as compared with 146,800 cars on September 23. The total included 53,170 box cars, 21,809 coal cars, 13,390 stock cars, and 7,256 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended October 6 totalled 89,651 cars, a decrease from the previous week of 2,636 cars, but an increase over the same week last year of 12,825 cars.

Total for Canada	Total Cars Loaded	Total Cars Rec'd from Connections
Oct. 6, 1928	89,651	42,347
Sept. 29, 1928	92,287	43,058
Sept. 22, 1928	94,631	41,505
Oct. 8, 1927	76,826	38,392
Cumulative Totals for Canada		
Oct. 6, 1928	2,719,302	1,570,174
Oct. 8, 1927	2,496,120	1,503,842
Oct. 9, 1926	2,390,654	1,493,077

THE EXPANDING NATURE of the task of the railroads of western Canada, in providing cars for the movement of the vast crops of that region, is illustrated by a news note from Lethbridge, Alberta, to the effect that a young farmer of Magrath who carries on operations on a large scale, using the most modern machinery, cut and stooked 1,000 acres of wheat in eight days, or 125 acres a day.

Looking Backward

Fifty Years Ago

The first meeting of the Central Association of General Ticket and Passenger Agents held at Chicago on October 10 accepted a resolution urging the adoption of an universal rule allowing the transportation of 150 lb. of baggage on each ticket. This limit of free baggage is 50 lb. more than the amount fixed recently by the General Ticket and Passenger Agents' Convention.—*Railway Age*, October 17, 1878.

Work on the section of the narrow gage railroad [now part of the Oregon-Washington Railroad & Navigation Company], which is being constructed between Umatilla, Ore., and La-Grande, 114 miles, is being pushed vigorously. The cost of grading over a rough country is $183 per mile. The steepest grade is 60 ft. per mile.—*Chicago Railway Review*, October 19, 1878.

The track of the Gulf, Colorado & Santa Fe is now laid from Galveston, Tex., to a point 5 miles west of Arcola, Tex., completing the first 50 miles for which Galveston county subscribed $500,000. It is expected that the new track will reach the crossing of the Galveston, Harrisburg & San Antonio [now part of the Southern Pacific] at Richmond, Tex., in November. —*Railroad Gazette*, October 18, 1878.

Twenty-Five Years Ago

A national transcontinental railway is assured to Canada by the passage this week in the Senate at Ottawa of the bill of the Grand Trunk Pacific Railway. The Eastern division, from Moncton, N. B. to Winnipeg, Man., some 1,800 miles, is to be built by the government but leased to and operated by the Grand Trunk Pacific, and the Western division from Winnipeg, Man., to Port Simpson, B. C., 1,300 miles, will be built and operated by the railway company.—*Railway Age*, October 23, 1903.

Impressive figures showing the material growth of the Northwest in the last two decades were given by James J. Hill, president of the Great Northern, in addressing an irrigation congress at Bismarck, N. D., this week. Referring to the Great Northern he said that in 1882 it moved 1,007,000 tons of freight, and that in 1903 it hauled 16,148,000 tons, an increase of 1,600 per cent in 21 years. At the average rate per ton per mile received in 1882 the freight earnings on this movement in 1903 would have $90,820,109, whereas the actual earnings were $30,915,000, a decrease through reduction of freight rates of nearly $60,000,000.—*Railway Age*, October 23, 1903.

Ten Years Ago

Louis C. Fritch, formerly general manager of the Seaboard Air Line, has been elected vice-president and corporate engineer of the Chicago, Rock Island & Pacific and the Minneapolis & St. Louis.—*Railway Age*, October 18, 1918.

After 20 years management of the Canadian Pacific, Lord Shaughnessy has resigned and Edward Wentworth Beatty, vice president and general counsel, has been elected to succeed him. Grant Hall, who has been general manager of the western lines, has been elected vice-president in charge of operation of the system.—*Railway Age*, October 18, 1918.

The wage increases by Director General McAdoo's order are not sufficient to satisfy the organizations of train and yard service employees. Five brotherhoods have filed requests for additional increases which include a proposition of time and one-half for overtime. The switchmen ask that overtime apply on Sundays and holidays and request a wage increase for foreman and helpers sufficient to make their rates 50 per cent more than those in effect on January 1.—*Railway Age*, October 18, 1918.

Communications and Books

Railway Furniture

WASHINGTON, D. C.

TO THE EDITOR:

A short item in the May 19 issue of the *Railway Age*, stating that the oldest desk in the railway service was owned by the Union Pacific, evidently developed some rivalry among the railroads as to the possession of old furniture. In the June 9 issue, L. F. Loree, President of the Delaware & Hudson, who had read the item about the oldest desk in railway service, stated that his railroad was the proud possessor of the oldest chair in railway service—a year older than the Union Pacific desk. Our association is naturally interested in the durability of wood furniture and we have had photographs made of the desk and chair.

The Delaware & Hudson Chair

In 1877, George E. Hubbard, a cabinet maker for the Union Pacific, built the desk for use in the Omaha office. His name and the date, "November 11, 1877, Omaha," appear on the inside of the desk. Until 1903 the desk remained in the Omaha offices of the railroad. Then it was moved to the freight depot at Fourth and "O" streets, Lincoln, where it is now being used by A. M. Mooberry, inspector in the Western Weighing and Inspection Bureau.

When Mr. Loree read about the old desk it occurred to him that some of the wood chairs in the New York office of his road were quite old—perhaps older than the oldest desk in the railway service. He looked up the history of the chairs and found that they were placed in the New York office of the Delaware & Hudson in 1876, which makes them a year older than the desk. "These wooden office chairs have been used continuously since January 11, 1876, and, from their present good condition, will continue in use for many years to come," he writes.

The Union Pacific Desk

THEODORE KNAPPEN, Director of Publicity,
National Lumber Manufacturers Association.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Sources of Carload Receipts of Food in Providence, Rhode Island, 1921-1925, by Roger B. Corbett. Tables, maps, charts, all supporting the contention that if it weren't for railway service, many persons couldn't eat. Bulletin 215. 106 p. Pub. by R. I. State College Experiment Station, Kingston, R. I.

Official Year Book of the Railways Athletic Association 1927-1928. First year book of an association composed of the men's and women's athletic clubs on the railways of Great Britain. Historical sketch, p. 28-36. Organizations and records of individual clubs, p. 48-78. Rules, p. 80-82. 82 p. Pub. by the Association, c/o Hon. Gen'l Secretary, P. W. Holdaway, Thornton Heath, Surrey, England. 1 shilling.

Periodical Articles

The Western Maryland Railway, by Paul T. Warner. Another contribution to a valuable series of short railway histories, emphasizing development of motive power. Illustrated. Baldwin Locomotives, October 1928, p. 7-25.

Some Economic Aspects of Aviation, by Dr. Julius H. Parmelee. An editorial note points out that in 1850 when railways were 25 years old there were 9,021 miles of them, while in 1928 when flying is 25 years old, there are 13,131 miles of airways. Pacific Flyer, October 1928, p. 10.

Odds and Ends of Railroading

T. E. Hill, superintendent, Illinois Central, Louisville, Ky., rates a new title now. By decree of Governor Sampson, Hill has joined the long and distinguished roster of Kentucky colonels.

Good Advice

"Where are some good places to stop on this trip?" asked the prospective automobile tourist.

"At all railroad crossings," replied the clerk in the touring bureau.

The Oldest Pensioner

On August 17, Thomas Gallagher, Flushing, N. Y., reached the age of 100. The Long Island claims for him the distinction of being the oldest railway pensioner in the world. He has been on the payroll of the Long Island for 68 consecutive years.

Oldest Active Employee?

For J. M. Horan, Milwaukee, Wis., aged 92, is claimed the distinction of being the oldest active railroad man in the world. For 73 years Horan has been in the employ of the Chicago, Milwaukee, St. Paul & Pacific, his present position being that of inspector of boilers.

A Record to Shoot At

Twenty-five months of highly exacting work without a single error is the record that was recently hung up by Willie Brock, a negro stowman employed by the Illinois Central at Jackson, Miss. Brock's duty is to load package freight in freight cars. Every day he handles several hundred packages, which he has to place properly in six cars. In June, 1926, the third month of his employment as a stowman, he loaded a package destined for Oakley, Miss., in an Oakvale, Miss., car. Since then he has not made an error.

Railway Boy Makes Good

One of the youngest assistant directors in the motion picture business is Nate Stein of Los Angeles, war orphan, famine refugee and former Illinois Central office boy. Stein, who is now 23 years old, left his job with the Illinois Central at Chicago five years ago to go to California to get work in the movies. He was born in the Ukraine, where he lost his parents, his father by massacre, and he made his way to the United States after becoming acquainted with American Y. M. C. A. workers in Roumania.

Ton Miles for Carelessness

A recent appeal for employee co-operation by the management of the Nashville, Chattanooga & St. Louis included a novel statistical presentation in its listing of the ton-mile production required to offset carelessness in train operation. The appeal called attention to the fact that a railroad must haul a ton of freight 2,254 miles to cover the cost of setting out, repairing and picking up a car on account of a hot box; 2,205 miles to cover the cost of replacing a broken drawhead; 506 miles to pay one hour's overtime for a train or yard crew; 395 miles to buy a ton of coal; 90 miles to pay for one foreign car for one day; and 43 miles to buy a gallon of valve oil.

Identifying Cabooses

One of the sights in the Union Pacific yard, Cheyenne, Wyo., is the line of cabooses, the cupola of each of which is surmounted by some distinguishing mark. There are replicas of horses and dogs, elkhorns, pyramids, lodge emblems, flags, miniature signal standards, letters, numerals and a variety of other things, all carved of wood and projecting from the top of the cupola. These symbols have an utilitarian as well as a decorative purpose. To get to the yard office, the conductors cross a viaduct over the tracks, and while on this viaduct, by means of the identification symbols, they are able to pick out the location of their own cabooses, thus avoiding a lot of unnecessary walking.

Peculiar Accident Department

At Zumbrota, Minn., recently, Goliath, the sea-elephant from the Arctic, caused a derailment of a circus train. This monster travels in a private steel car. He tips the scales at 4½ tons and, it is reported, his playful thrashing about caused his car to derail.

T. T. Maxey, special representative, Delaware, Lackawanna & Western, also reports a new brand of accident. He says:

"At 3:15 a. m., on August 4, a passenger occupying a lower berth on our train No. 15, while in the throes of a nightmare, kicked his foot through the window, causing lacerations which made it necessary to take him to a hospital at Scranton, Pa., on the arrival of the train at that point, at our expense."

Shortest Station Names

With the assistance of the Railway Gazette of London, the *Railway Age* has succeeded in compiling what seems to be a complete list of all the shortest railway station names in the world. Sweden leads the list with seven such stations, "Ed", "Fu", "Le", "Ra", "Ro", and "Od". France is second with three, "Us" and "Ay" on the Chemin de Fer de l'Est, and "Eu" on the Chemin de Fer du Nord. Hawaii contributes "Li" on the Oahu Railway. The Argentine railways contribute "Lu". There are only two two-letter station names on the railways of North America. Peculiarly enough, both of them are in Kentucky. "Oz" is on the Kentucky & Tennessee and "Uz" is on the Louisville & Nashville.

Names Sometimes Are Misleading

The Way-Bill of the Traffic Club of Chicago offers this bit of imaginary conversation apropos the possible confusion in names in this aerial age:

"Queen interested in air transportation says to the ace: 'I wanna go up; what's the rate?' Ace: 'About a hundred miles an hour'. Queen: 'I mean the tariff; what do you charge?' Ace: 'A mile for a five spot'. Queen: 'That's high in price, but low in up.' Ace: 'Two miles for a ten spot; the higher you go the hire is higher'. Queen: 'You are quite a joker and a kind of "fresh" airman at that; and you can go to the deuce, you big four-flusher'. And she went over to the Twelfth Street Depot and spent her 'jack' to ride the St. Charles Air Line—out to the Fox River for a dollar and a half."

Unique Argument From Wisconsin

Residents of the village of Markesan, Wis., presented a unique argument to the railroad commission when they opposed granting a permit to a bus line on the ground that if the bus line were permitted the Chicago, Milwaukee, St. Paul & Pacific would quit hauling passengers through the village and it would lose the business of the railroad crew which nightly lays over in Markesan. The railroad commission found that the Milwaukee now hauls but few passengers over the line and that bus service by the Central Wisconsin Transportation Company from Fond du Lac to Portage is needed. The commission pointed out that the village of Markesan can protest removal of the train or passenger service when an application for such action is made.

NEWS *of the* WEEK

THE NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS will hold its 11th annual convention in the Arlington Hotel, Hot Springs, Ark., on April 23, 24 and 25, 1929.

THE WASHINGTON SECTION of the American Society of Mechanical Engineers, at its meeting in Washington, on October 19, listened to a paper by G. E. Ellis, secretary of the train control committee of the American Railway Association, on the subject of automatic train control.

THE RAILWAY CLUB OF PITTSBURGH will hold its next meeting at Fort Pitt Hotel on Thursday evening, October 25. This will be the annual meeting, with election of officers, followed by an entertainment; and the meeting will be preceded by a dinner for members and guests at six o'clock.

THE STRIKE OF EMPLOYEES of the American Railway Express in New York City and vicinity, which last week put an almost complete embargo on traffic for two days, was ended on Thursday, October 11, when the strikers voted unanimously to return to work. Mr. Harrison, head of the clerks' brotherhood, told the strikers they "must go into court with clean hands" by carrying out the terms of their contract with the company. The company agreed to take back all of the men.

THE AMERICAN TRAIN DISPATCHERS' ASSOCIATION has started a movement for the establishment of a six-hour day for train dispatchers, J. G. Luhrsen, president, stated at Chicago recently. The demand for shortening of the work-day will be based on its necessity as a public safety measure and as a means of protecting the health of dispatchers. Mr. Luhrsen proposes that Congress be asked to enact such a law. About 5,500 men would be affected by such a change.

ALFRED CHAPMAN, formerly in charge of the Pass Bureau of the Chesapeake & Ohio, (Richmond, Va.) has been sentenced by the United States District Court to 18 months' imprisonment in the penitentiary at Atlanta, Ga., and fined $1000, for selling passes. Two negro preachers, one of Roanoke and one of Norfolk, were at the same time fined $500 each and sentenced to three months in prison for their part in purchasing passes; the jail sentence, however, being suspended. It appears that the preachers were active in procuring passes for negroes to attend a convention in Chicago.

THE WESTERN UNION TELEGRAPH COMPANY, following negotiations with representatives of employees, has ordered increases in pay, beginning with next January, which it is said will inure to the benefit of several thousand employees. These increases go to men receiving less then $3,000 yearly, and it is stated that important increases have already been granted to the men above this grade. It has been agreed also that employees who have served the company 30 years or more shall hereafter have three weeks' vacation annually instead of two.

Automatic Train Control Installation Approved

Division 6 of the Interstate Commerce Commission has issued a report approving, with some exceptions, the installations of the automatic train control device of the Union Switch & Signal Company, continuous induction type, code system, on the Bethlehem branch of the New York division of the Reading, between Jenkintown and Bethlehem, Pa., 46 miles, double track. The total cost of this installation was: roadway $612,863; locomotives (80) $257,470; total $870,333.

Wage Statistics

The number of employees reported to the Interstate Commerce Commission by Class I railways as of the middle of July was 1,728,690, and the total compensation for the month was $241,831,372. Compared with the returns for the corresponding month last year, the present record shows for every reporting group a decrease in the number of employees, and in the average number of employees per working day. The total number decreased 5.19 per cent and the total compensation decreased 3 per cent.

At the middle of August the number of employees was 1,730,880, a decrease of 3.64 per cent as compared with August, 1927.

Moffat Tunnel Assessment

The United States district court at Denver, Colo., on October 6, refused to restrain the Moffat tunnel commission from levying a special assessment on property to pay interest on $8,750,000 of bonds which were issued to complete the tunnel. The decision, by Judge Robert J. Smith, holds that the commission erred in leasing the tunnel to but one railroad, the Denver & Salt Lake, for $345,000 yearly, a sum which is less than the annual interest on the bonds. It is thought likely that the case will be appealed to the Supreme Court of Colorado.

Mechanical Division to Meet At Los Angeles

Pacific coast railroad men who, as members of the A. R. A. Mechanical division have been attending annual meetings held in the East for years, will have an opportunity to play host to the next convention. The General Committee of the division has decided that the 1929 meeting will be held at Los Angeles, Cal., in the latter part of June, the definite date to be announced later. This will be the first time that the convention has ever met west of Chicago except in 1887 when the annual meeting was held in Minneapolis, Minn.

Storm Damage on Southern Pacific of Mexico

Through train service was suspended on the Southern Pacific of Mexico from September 20 to 27 when heavy general rains with high wind, resulted in numerous washouts between Mazatlan, Sin., and Acaponeta, Nay., 93 miles. The storm extended from Modesto, Sin., to Acaponeta, about 103 miles. At Mazatlan, 6 in. of rain fell during the storm, which began during the evening of September 20 and continued until the afternoon of the next day, and at Rosario, Sin., 40 miles south of Mazatlan, 15 in. of rain fell in 15 hours. The most severe damage

to the roadway and track occurred near Rosario where the flood water cut through and washed out 450 ft. of a 15-ft. fill and a pile trestle over the Rosario river. The damage to railroad property is estimated at $20,000.

Locomotives Exempted from Rule 116 (i)

The Interstate Commerce Commission on October 10 made public an order by which Rule 116 (i), of its rules for the inspection and testing of steam locomotives, requiring that steam locomotives be equipped with cab storm windows, shall not apply to locomotives used on the Panhandle division of the Pennsylvania. The rules provide for an exemption if upon investigation it is found that clearances will not permit safe operation of locomotives equipped with storm windows.

At the same time the commission denied a petition of the Chesapeake & Ohio for exemption of locomotives used on its lines, saying that "practically all, if not all, locomotives used on the lines of the carrier are now and have for several years been equipped with cab storm windows and the same have been used with safety."

Automatic Train Control at Western Railway Club

The Western Railway Club studied the subject of train control at its meeting held in Chicago on October 15. J A. Peabody, signal engineer, Chicago & North Western, explained the general development of automatic train control and discussed in detail the operation of the two-speed continuous system now in service, without intermediate wayside signals, on the C. & N. W. between Chicago and Omaha, Neb. W. C. Bennett,, road foreman of engines, C. & N. W., stated that the cab signals reduced delays in stormy or foggy weather and also the number of train stops in ordinary operation. H. P. Alstrand, assistant superintendent of motive power of the same road, stated that the maintenance of the equipment on the engines had not been as troublesome as anticipated. In his opinion, the savings through the elimination of the maintenance of the wayside signals more than offset the cost of the electrical cab signaling devices on the locomotive.

Safety Program for November

Two thousand three hundred and sixty-one persons have been killed in the last five years while getting on or off locomotives or cars, and the Committee on Education of the Safety Section of the American Railway Association, L. G. Bentley, chairman, recommends, in circular No. 210, that fatalities due to falls, from this and other causes, be made the subject for special attention by all safety committees during the month of November.

This number, 2,361, includes 381 employees, 224 passengers, 24 other persons not trespassing and 1,732 trespassers. Adding the totals of falls while operating handbrakes and falls of persons in non-train accidents (carpenters, trackmen, shopmen, etc.) brings the total fatalities for five years up to 2,790. And 810 of these victims were employees.

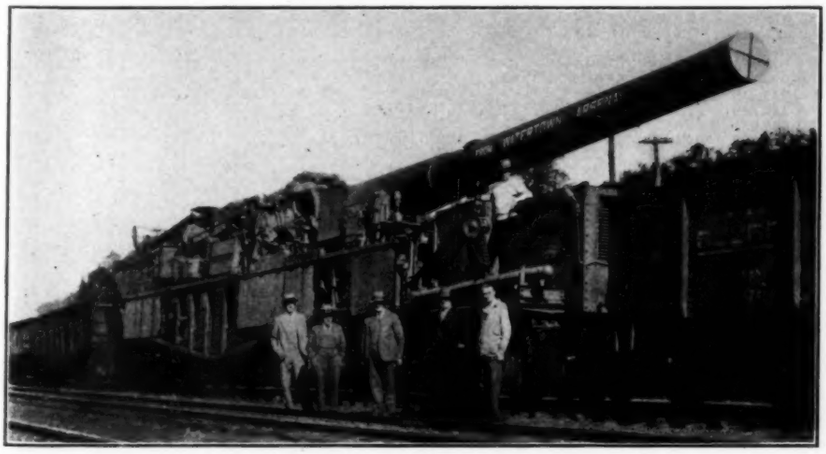
The committee calls attention to the fact that the total number of falls reported in the 12 months of 1927 (551 persons killed and 16,661 injured) shows a reduction of 34 per cent from 1923, in the injured column, but a reduction of only 20 per cent in the killed column.

The circular is illustrated with blood-curdling pictures of men falling off cars, high trestles, etc.

A 365-ton Load

The New York, New Haven & Hartford moved recently (October 5-6) from Worcester, Mass. to Maybrook, N. Y., a fourteen-inch gun (shipped from the U. S. Arsenal, Watertown, Mass.) which weighed 730,000 lb., this being the combined weight of the gun and its car, on which it is permanently mounted. This car has four trucks and fourteen pair of wheels; and it is 85 ft. long over couplers. The axle loads range from 49,750 lb. to 54,000 lb. and the height of the load above the rail is 14 ft. 6 in. This gun with its car, weighs about 150 tons more than any similar load heretofore moved over the New Haven. The previous shipments were sent over the Boston & Maine and the New Haven to Harlem River and thence over the Hellgate bridge to Bay Ridge, N. Y., whence they were carried across to New York Bay on car floats to the Pennsylvania terminal at Greenville, N. J., but the float bridges at Greenville are not of sufficient capacity for this load.

The speed of the train carrying this shipment was limited to 20 miles an hour at all points; to 15 miles an hour over steel bridges and to 10 miles an hour over timber bridges and the Poughkeepsie bridge across the Hudson river. The destination of the gun was Aberdeen, Md., by way of the Lehigh & Hudson River to Belvidere, N. J., and thence by the Pennsylvania.



Fourteen Axles Carrying 730 M's.

Second International Conference on Bituminous Coal

More than a hundred speakers, representing 12 nations, are tentatively listed to present papers at the Second International Conference on Bituminous Coal to be held under the auspices of the Carnegie Institute of Technology at Pittsburgh, Pa., November 19 to 24, 1928, according to a preliminary program announced by President Thomas S. Baker. The chief purpose of the coming conference will be to present the results of recent studies of coal that have to do with improved methods of utilization and combustion. Approximately 60 of the speakers already listed to participate in the proceedings will come from outside of the United States.

The preliminary program of major subjects, which the speakers will discuss, includes pulverized fuel, under which are listed two papers of particular interest to the railroad. The subjects and authors of these papers are "Pulverized Fuel Conveying and Firing with Special Reference to Locomotives and Marine Boilers," by Dr. George E. K. Blythe, general manager, the Buel Combustion Company, London, England, and "The Powdered Coal Locomotive of the (German) General Electric Company," by Baurat Walter Kleinow, Henningsdorf, Germany. The remaining major subjects are Origin, Combustion and Classification of Coal, Fertilizers, Liquefaction and Hydrogenation, High Temperature Carbonization, Purification and Cleaning, Low Temperature Processes, Tars and Oils, and Combustion in Furnaces. W. L. Robinson, superintendent of fuel and locomotive performance, Baltimore & Ohio, is scheduled as one of the speakers on the last major subject listed but the title of his papers has not yet been announced.

Railway Treasury Officers Meet At Atlanta

The twenty-second annual meeting of the Railway Treasury Officers Association was held at the Atlanta-Biltmore Hotel, Atlanta, Ga., on October 11-13.

Addresses were heard from James B. Hill, president of the Nashville, Chattanooga & St. Louis; Col. B. L. Bugg, president, Atlanta, Birmingham & Coast, and H. P. Conner, assistant treasurer of the Pennsylvania and president of the

(*Continued on page 786*)

Operating Statistics of Large Steam Railways—Selected Items for August, 1928, Compar

Region, road and year		Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotives and tenders	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:													
Boston & Albany	1928	407	186,509	198,872	21,801	4,997	69.1	252,905	95,946	99	20	17.0	31
	1927	407	194,644	207,889	21,123	4,990	68.2	255,942	97,651	109	15	12.0	7
Boston & Maine	1928	2,074	400,940	478,684	67,918	13,076	71.9	649,309	261,663	276	42	13.1	51
	1927	2,075	455,794	523,392	50,500	12,452	71.7	625,199	254,748	277	73	20.8	34
N. Y., New H. & Hart.	1928	2,119	549,296	612,065	35,770	16,533	67.5	878,241	356,912	317	52	14.1	44
	1927	2,140	580,559	628,448	39,618	16,484	67.7	869,006	360,789	325	67	17.0	57
Great Lakes Region:													
Delaware & Hudson	1928	875	327,842	443,410	52,786	10,338	64.7	638,061	303,722	244	41	14.4	96
	1927	875	362,291	483,984	49,647	10,529	65.4	667,455	337,544	250	36	12.6	83
Del., Lack. & Western	1928	998	527,859	588,270	67,885	17,834	70.1	971,729	414,002	241	59	19.6	33
	1927	999	546,395	615,887	72,771	17,822	68.7	983,498	418,001	251	52	17.2	33
Erie (inc. Chi. & Erie)	1928	2,317	886,422	956,263	76,848	39,570	65.9	2,302,646	957,602	415	111	21.1	49
	1927	2,317	987,482	1,080,390	96,104	40,004	64.8	2,409,663	1,022,475	407	160	28.2	17
Lehigh Valley	1928	1,346	561,500	613,164	64,958	18,141	66.4	1,064,974	471,583	335	93	21.6	69
	1927	1,345	572,847	626,390	69,754	18,099	65.7	1,078,135	486,040	368	80	17.8	65
Michigan Central	1928	1,822	567,593	587,892	20,704	20,283	62.2	1,128,502	402,670	197	63	24.2	24
	1927	1,820	588,672	605,925	21,750	20,056	61.7	1,123,276	412,725	234	65	21.8	57
New York Central	1928	6,459	2,009,224	2,242,728	147,339	78,500	61.8	4,780,089	2,017,499	1,004	357	26.3	251
	1927	6,478	1,933,585	2,152,738	141,823	76,802	62.3	4,712,622	2,051,629	1,124	262	18.9	364
New York, Chi. & St. L.	1928	1,665	591,937	600,064	6,836	20,513	65.6	1,127,452	436,950	227	56	19.9	66
	1927	1,665	603,136	611,189	6,873	20,800	65.0	1,153,157	445,686	237	50	17.4	62
Pere Marquette	1928	2,181	473,654	478,440	5,692	12,733	64.0	760,805	335,259	177	37	17.1	9
	1927	2,180	459,988	465,774	6,171	12,196	65.0	710,932	309,425	184	41	18.4	9
Pitts. & Lake Erie	1928	231	115,498	117,695	1,151	4,525	65.7	357,161	208,401	54	16	22.8	15
	1927	231	114,413	116,773	1,320	4,666	64.5	362,396	212,230	59	17	21.8	15
Wabash	1928	2,497	809,598	844,393	12,983	25,378	65.1	1,436,173	560,584	297	71	19.3	39
	1927	2,497	744,104	779,913	15,029	23,214	65.3	1,324,055	528,918	312	59	15.9	74
Central Eastern Region:													
Baltimore & Ohio	1928	5,534	1,999,011	2,366,312	189,804	61,872	62.5	4,144,629	1,992,529	1,025	230	18.3	152
	1927	5,540	2,124,088	2,490,968	206,289	63,475	61.9	4,317,249	2,114,314	1,053	233	18.1	100
Central of New Jersey	1928	691	281,228	304,277	44,214	8,337	58.5	548,014	255,933	179	32	15.1	26
	1927	691	275,257	301,791	50,706	8,088	57.9	537,946	250,107	180	35	16.2	23
Chicago & Eastern Ill.	1928	945	251,487	252,191	3,668	7,063	66.5	412,127	183,123	112	59	34.5	42
	1927	945	276,952	288,401	4,117	7,345	64.9	447,406	208,394	123	42	25.3	46
Clev., Cin., Chi., & St. L.	1928	2,370	765,463	789,107	18,601	24,928	60.8	1,605,900	723,949	329	107	24.6	58
	1927	2,374	776,008	811,570	23,590	25,131	62.4	1,648,366	789,968	331	110	25.0	43
Elgin, Joliet & Eastern	1928	461	135,178	140,465	5,380	3,935	65.2	284,362	138,849	80	10	11.1	5
	1927	461	138,916	145,031	4,779	3,962	64.5	296,632	157,702	80	12	13.3	5
Long Island	1928	396	49,318	50,005	12,953	592	56.8	39,126	15,412	57	9	14.1	4
	1927	396	49,203	53,452	12,661	675	58.1	43,058	16,916	48	9	15.4	3
Pennsylvania System	1928	10,742	4,046,029	4,594,597	404,980	141,953	64.4	9,248,011	4,283,479	2,751	343	11.1	750
	1927	10,844	4,389,837	4,844,071	386,076	138,817	64.2	9,080,716	4,259,517	2,893	373	11.4	732
Reading	1928	1,128	583,678	648,484	47,765	16,801	61.7	1,154,785	577,407	311	75	19.4	65
	1927	1,131	624,935	675,356	64,240	16,683	59.7	1,177,079	587,191	319	74	18.9	55
Pocahontas Region:													
Chesapeake & Ohio	1928	2,727	1,115,800	1,192,753	45,337	39,142	57.3	3,152,374	1,710,830	542	93	14.7	77
	1927	2,702	1,289,241	1,403,487	57,672	43,370	55.4	3,544,073	1,909,053	543	95	14.9	24
Norfolk & Western	1928	2,231	838,772	976,318	36,371	32,113	59.0	2,651,737	1,421,536	517	52	9.2	153
	1927	2,232	887,215	1,073,726	36,965	32,074	59.3	2,676,978	1,449,467	558	54	8.8	147
Southern Region:													
Atlantic Coast Line	1928	5,127	566,186	570,110	7,486	14,360	62.8	774,267	288,756	437	48	10.0	95
	1927	5,097	630,599	637,838	9,085	15,537	62.8	866,647	341,156	427	56	11.7	114
Central of Georgia	1928	1,898	283,080	286,246	3,801	6,946	70.2	366,315	151,140	136	23	14.4	11
	1927	1,898	270,192	273,317	6,038	6,990	72.2	366,972	157,314	140	24	14.6	15
Ill. Cent. (inc. Y. & M. V.)	1928	6,738	1,866,180	1,885,234	29,882	52,501	63.1	3,347,819	1,398,674	763	107	12.3	66
	1927	6,594	2,057,698	2,081,673	49,566	56,464	63.0	3,658,897	1,597,339	792	94	10.7	16
Louisville & Nashville	1928	5,061	1,685,268	1,756,811	59,692	36,622	57.9	2,558,691	1,223,887	603	107	15.0	51
	1927	5,048	1,802,490	1,880,795	65,592	38,274	58.8	2,710,466	1,322,960	637	94	12.8	31
Seaboard Air Line	1928	4,485	512,094	529,247	7,762	12,480	63.6	700,817	270,837	268	61	18.5	22
	1927	4,295	490,771	497,567	5,310	11,971	64.4	672,241	272,832	237	52	18.1	39
Southern	1928	6,718	1,529,628	1,561,149	31,151	37,633	64.5	2,104,232	845,940	860	108	11.2	140
	1927	6,718	1,428,764	1,454,871	31,197	36,094	66.9	1,969,010	806,402	845	107	11.3	83
Northwestern Region:													
Chi. & North Western	1928	8,463	1,562,426	1,643,709	29,563	41,060	61.6	2,504,533	989,208	754	136	15.3	76
	1927	8,463	1,542,472	1,608,847	30,311	39,503	62.8	2,364,068	926,454	753	135	15.2	75
Chi., Milw., St. P. & Pac.	1928	11,248	1,878,965	2,021,407	117,341	55,450	59.8	3,439,919	1,417,906	861	124	13.4	132
	1927	11,202	1,773,854	1,894,460	120,164	52,834	64.1	3,116,338	1,334,645	800	146	15.4	135
Chi., St. P., Minn. & Om.	1928	1,724	357,143	392,532	15,023	7,858	72.5	433,856	198,891	156	26	14.0	15
	1927	1,724	343,554	369,491	15,007	7,642	70.6	423,957	188,395	168	30	15.1	20
Great Northern	1928	8,305	958,282	989,380	75,504	35,621	61.5	2,252,490	1,053,820	486	137	22.0	57
	1927	8,164	860,348	888,818	56,318	32,635	61.8	2,057,659	962,896	522	164	23.9	99
Minn., St. P. & S. St. M.	1928	4,358	527,429	545,484	5,219	14,700	66.3	800,678	348,660	211	34	14.0	17
	1927	4,368	547,828	568,076	7,667	14,866	67.4	818,912	374,838	285	35	11.1	8
Northern Pacific	1928	6,415	944,883	1,007,554	57,405	30,987	63.2	1,827,629	744,035	426	135	24.1	21
	1927	6,476	905,773	970,613	53,537	27,869	59.8	1,669,049	666,907	470	143	23.3	57
Oreg.-Wash. R. R. & Nav.	1928	2,246	227,738	239,502	16,857	6,935	69.4	404,913	181,538	129	14	9.9	3
	1927	2,154	230,353	241,981	18,711	6,837	69.3	408,480	189,877	136	13	8.5	10
Central Western Region:													
Atch., Top. & S. Fe (incl. P. & S. F.)	1928	10,455	1,757,466	1,902,166	99,500	59,244	63.2	3,584,938	1,304,566	784	136	14.8	148
	1927	10,404	1,770,528	1,910,576	107,621	58,788	63.2	3,532,102	1,251,330	785	152	16.3	154
Chicago & Alton	1928	1,000	317,340	345,519	3,573	8,122	63.6	486,168	198,920	111	43	27.8	7
	1927	995	305,772	330,749	2,655	7,353	59.1	462,146	173,451	139	20	12.3	36
Chi., Burl. & Quincy	1928	9,317	1,621,683	1,686,881	76,087	52,023	61.9	3,155,174	1,443,458	741	156	17.4	69
	1927	9,334	1,487,090	1,553,305	74,982	45,690	63.7	2,625,205	1,162,458	744	163	18.0	67
Chi., Rock I. & Pacific	1928	7,564	1,488,227	1,566,040	15,910	37,762	64.9	2,242,731	966,528	560	107	16.0	38
	1927	7,575	1,412,181	1,470,787	16,397	36,599	62.7	2,203,404	929,944	550	116	17.4	46
Denver & Rio G. Wn.	1928	2,563	259,086	301,252	50,841	7,565	66.3	451,024	194,059	227	40	15.0	29
	1927	2,571	285,754	341,712	64,717	8,090	69.2	465,106	199,315	237	37	13.3	21
Oregon Short Line	1928	2,539	320,666	338,757	29,673	9,828	63.3	601,753	248,481	162	24	12.8	27
	1927	2,539	314,972	337,338	28,639	9,403	64.8	561,186	235,138	177	26	13.0	41
So. Pacific—Pacific Lines	1928	8,736	1,707,551	1,863,366	261,025	52,592	62.8	3,226,404	1,187,503	762	173	18.5	70
	1927	8,770	1,635,372	1,781,974	249,342	49,760	61.7	3,080,125	1,108,995	735	195	20.9	60
Union Pacific	1928	3,748	1,387,035	1,419,977	70,608	48,036	57.9	2,979,950	1,032,381	420	45	9.6	67
	1927	3,712	1,206,965	1,243,347	64,847	45,386	60.1	2,784,389	923,165	442	46	9.4	109
Southwestern Region:													
Gulf, Colo. & S. Fe	1928	1,933	239,968	249,754	7,626	7,972	66.6	491,910	224,961	133	18	12.1	45
	1927	1,933	304,995	314,067	7,757	9,343	61.0	603,338	265,704	143	22	13.4	29
Mo.-Kans.-Texas Lines	1928	3,176	480,303	490,650	15,447	16,294	60.0	990,764	401,409	205	45	18.1	69
	1927	3,176	427,351	432,306	9,650	14,165	60.9	836,845	331,110	218	26	10.5	98
Missouri Pacific	1928	7,433	1,426,233	1,480,259	47,833	42,369	65.1	2,500,190	1,058,264	540	92	14.5	18
	1927	7,331	1,321,081	1,359,526	48,001	37,144	64.7	2,207,266	937,854	569	83	12.7	50
St. Louis-San Francisco	1928	5,222	884,750	901,837	10,733	21,168	60.0	1,285,613	534,978	404	61	13.0	49
	1927	4,860	784,080	798,821	9,992	19,611	61.0	1,193,272	493,533	394	57	12.6	80
Texas & New Orleans	1928	4,708	738,882	740,801	2,490	16,274	67.2	934,948	388,495	266	73	21.5	42
	1927	4,559	761,034	765,184	1,183	17,169	65.1	1,019,575	419,196	255	61	19.2	40
Texas & Pacific	1928	2,015	531,645	531,645	5,071	13,898	57.1	934,817	376,298	203	18	8.3	22
	1927	1,954	306,024	306,024	1,356	8,626	63.2	509,850	195,244	165	29	14.8	31

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

ed with August, 1927, for Roads with Annual Operating Revenues Above $25,000,000.

Region, road and year	Average number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross tons per train, excluding locomotives and tenders	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive miles per locomotive-day
New England Region:													
Boston & Albany....1928	2,409	5,263	7,672	3.7	18,573	1,356	514	19.2	403	30.4	7,604	159	59.8
1927	3,094	4,758	7,852	3.3	17,960	1,315	502	19.6	401	30.0	7,739	161	59.5
Boston & Maine....1928	12,073	11,488	23,561	6.0	18,731	1,619	653	20.0	358	24.9	4,070	107	55.5
1927	13,838	11,577	25.415	7.1	14,837	1,372	559	20.5	323	22.0	3,960	113	52.9
N. Y., New H. & Hart..1928	17,271	16,339	33,610	8.7	20,359	1,599	650	21.6	343	23.5	5,433	104	56.6
1927	22,154	17,063	39,217	15.0	18,821	1,497	621	21.9	297	20.0	5,439	113	55.0
Great Lakes Region:													
Delaware & Hudson....1928	8,504	5,393	13,897	4.5	24,331	1,946	926	29.4	705	37.1	11,197	129	56.1
1927	8,495	5,704	14,199	4.6	22,800	1,842	932	32.1	767	36.6	12,442	137	60.3
Del., Lack. & Western...1928	16,593	7,578	24,171	5.2	22,873	1,841	784	23.2	553	34.0	13,383	119	70.7
1927	16,911	7,657	24,568	4.3	21,669	1,800	765	23.5	549	34.1	13,493	128	73.2
Erie (inc. Chi. & Erie)..1928	29,568	19,626	49,194	4.3	31,971	2,598	1,080	24.2	628	39.4	13,333	108	63.4
1927	33,520	20,122	53,642	5.4	27,845	2,440	1,035	25.6	615	37.1	14,234	121	66.9
Lehigh Valley 1928	22,812	10,208	33,020	12.5	25,748	1,897	840	26.0	461	26.7	11,303	134	51.1
1927	22,325	8,856	31.181	10.9	25,072	1,882	848	26.9	503	28.5	11,654	137	50.2
Michigan Central 1928	17,402	16,457	33,859	6.6	30,793	1,988	709	19.9	384	31.0	7,129	100	75.4
1927	15,811	15,261	31,072	5.2	27,930	1,908	701	20.6	428	33.7	7,317	102	67.7
New York Central....1928	63,898	69,548	133,446	7.0	30,919	2,379	1,004	25.7	488	30.7	10,076	98	56.7
1927	69,370	69,754	139,124	4.4	29,756	2,437	1,061	26.7	476	28.6	10,216	97	53.4
New York, Chi. & St. L..1928	13,504	9,940	23,444	6.1	26,098	1,905	738	21.3	601	43.0	8,467	99	69.2
1927	13,518	11,328	24,846	6.0	25,662	1,912	739	21.4	579	41.5	8,635	97	69.4
Pere Marquette 1928	9,451	10,070	19,521	3.9	20,147	1,606	708	26.3	554	32.9	4,960	92	73.3
1927	9,198	9,471	18,669	4.2	18,861	1,545	673	25.4	535	32.4	4,578	96	67.7
Pitts. & Lake Erie....1928	14,090	8,353	22,443	6.4	33,455	3,092	1,804	46.1	300	9.9	29,068	93	54.5
1927	13,203	7,614	20,817	3.9	34,739	3,167	1,855	45.5	329	11.2	29,578	85	50.3
Wabash 1928	14,941	12,762	27,703	2.9	28,399	1,774	692	22.1	653	45.4	7.242	109	75.1
1927	16,199	12,258	28,457	2.7	27,904	1,779	711	22.8	600	40.3	6,833	103	69.1
Central Eastern Region:													
Baltimore & Ohio....1928	73,734	30,726	104,460	6.0	23,396	2,073	997	32.2	615	30.6	11,614	133	65.7
1927	73,188	34,197	108,105	5.8	21,281	2,033	995	33.3	631	30.6	12,312	139	67.7
Central of New Jersey...1928	18,155	10,547	28,702	5.7	21,354	1,949	910	30.7	288	16.0	11,948	134	53.3
1927	18,771	10,778	29,549	5.0	19,317	1,954	909	30.9	273	15.2	11,678	148	52.8
Chicago & Eastern Ill....1928	13,323	4,405	17,728	33.0	23,123	1,639	728	25.9	333	19.3	6,250	122	48.3
1927	13,934	4,803	18,737	26.5	22,392	1,615	752	28.4	359	19.5	7,113	134	57.2
Clev., Cin., Chi. & St. L..1928	21,236	20,552	41,788	4.7	27,576	2,098	946	29.0	559	31.7	9,852	106	59.7
1927	19,646	21,276	40,922	5.6	26,467	2,124	1,018	31.4	623	31.8	10,735	109	61.1
Elgin, Joliet & Eastern..1928	9,141	7,393	16,534	5.5	16,197	2,104	1,027	35.3	271	11.8	9,716	116	52.3
1927	8,931	6,993	15,924	5.6	14,679	2,135	1,135	39.8	319	12.4	11,035	122	52.5
Long Island 1928	1,739	4,027	5,766	1.5	5,129	793	313	26.0	86	5.8	1.256	302	30.8
1927	1,707	4,917	6,624	1.4	5,003	875	344	25.1	82	5.7	1,379	263	37.3
Pennsylvania System 1928	215,360	83,739	299,099	6.2	26,032	2,286	1,059	30.2	462	23.8	12,864	117	52.1
1927	215,451	83,269	298,720	5.9	23,000	2,069	970	30.7	460	23.4	12,671	117	51.6
Reading 1928	26,776	11,558	38,334	5.8	21,901	1,978	989	34.4	486	22.9	16,511	134	58.1
1927	26,149	12,006	38,155	2.9	20,954	1,884	940	35.2	496	23.6	16,744	127	60.7
Pocahontas Region:													
Chesapeake & Ohio....1928	29,847	10,034	39,881	3.5	34,288	2,825	1,533	43.7	1,384	55.2	20,238	81	62.8
1927	27,991	16,641	44,632	3.1	29,947	2,749	1,481	44.0	1,380	56.5	22,789	90	73.9
Norfolk & Western....1928	29,181	8,669	37,850	1.0	42,340	3,161	1,695	44.3	1,212	46.3	20,550	117	57.4
1927	27,918	9,309	37,227	1.6	39,567	3,017	1,634	45.2	1,256	46.9	20,952	123	58.5
Southern Region:													
Atlantic Coast Line....1928	21,191	6,218	27,409	6.1	18,406	1,368	510	20.1	340	26.9	1,817	109	38.4
1927	22,428	7,055	29,483	5.9	17,674	1,374	541	22.0	373	27.1	2,159	111	43.2
Central of Georgia....1928	5,284	5,342	10,626	3.3	17,972	1,294	534	21.8	459	30.0	2,569	131	58.8
1927	4,469	5,763	10,232	3.4	18,126	1,358	582	22.5	496	30.5	2.674	129	54.9
Ill. Cent. (inc. Y.&M.V.)1928	41,967	20,934	62,901	6.7	23,622	1,794	749	26.6	717	42.6	6,696	114	71.1
1927	40,832	26,965	67,797	7.5	23,229	1,778	776	28.3	760	42.6	7,814	116	77.6
Louisville & Nashville...1928	43,933	16,762	60,695	9.7	20,200	1,518	726	33.4	650	33.6	7,800	133	82.6
1927	41,485	19,285	60,770	11.3	17,554	1,504	734	34.6	702	34.5	8,453	138	86.0
Seaboard Air Line....1928	15,342	6,331	21,673	8.1	17,411	1,369	529	21.7	403	29.2	1,948	132	52.6
1927	15,233	7,342	22,575	6.4	16,941	1,370	556	22.8	390	26.6	2,049	134	56.1
Southern 1928	48,169	17,422	65,591	9.1	18,087	1,376	553	22.5	416	28.7	4,062	146	53.0
1927	44,317	18,230	62,547	5.2	18,076	1,378	564	22.3	416	27.8	3,872	152	50.3
Northwestern Region:													
Chi. & North Western..1928	46,591	31,582	78,173	6.4	20,841	1,603	633	24.0	408	27.5	3,770	113	60.6
1927	48,540	32,080	80,620	7.9	18,997	1,533	601	23.5	371	25.2	3,531	117	59.5
Chi., Mil., St. P. & Pac..1928	48,973	28,862	77,835	3.1	23,450	1,831	755	25.6	588	38.4	4,067	115	74.6
1927	54,636	29,671	84,307	5.6	22,276	1,757	752	25.3	511	31.5	3,843	122	68.7
Chi., St. P., Minn. & Om.1928	2,670	9,516	12,186	7.2	15,510	1,215	557	25.3	526	28.7	3,722	111	72.3
1927	2,946	9,429	12.375	9.8	15,414	1,234	548	24.7	491	28.2	3,526	110	62.8
Great Northern 1928	40,632	14,994	55,626	4.3	27,990	2,351	1,100	29.6	611	33.6	4,093	115	55.1
1927	42,694	17,337	60,031	6.0	28,250	2,392	1,119	29.5	517	28.4	3,804	109	44.4
Minn., St. P. & S. S. M..1928	20,715	8,152	28,867	4.1	17,946	1,518	661	23.7	399	25.4	2,581	98	72.5
1927	21,257	7,969	29,226	4.0	17,629	1,495	684	25.2	418	24.6	2,768	95	58.0
Northern Pacific 1928	37,254	10,300	47,554	7.2	24,834	1,934	787	24.0	505	33.3	3,742	137	61.3
1927	38,707	10,074	48,781	7.1	23,829	1,843	736	23.9	441	30.8	3,322	134	53.9
Ore.-Wash. R.R. & Nav..1928	7,681	5,613	13,294	4.5	21,450	1,778	797	26.2	441	24.2	2,608	150	58.0
1927	7,446	5,687	13,133	5.7	20,615	1,773	824	27.8	466	24.2	2,844	156	56.7
Central Western Region:													
Atch., Top. & S. Fe (incl. 1928	58,711	24,542	83,253	5.2	30,075	2,040	742	22.0	505	36.3	4,025	101	70.2
P. & S. F.)....1927	59,411	18,380	77,791	5.4	28,100	1,995	707	21.3	519	38.6	3,880	104	69.5
Chicago & Alton....1928	10,200	4,928	15,128	3.8	22,272	1,532	627	24.5	424	27.3	6,418	124	73.6
1927	10,345	5,085	15,430	4.9	19,864	1,511	567	23.6	363	26.0	5,623	121	67.6
Chi., Burl. & Quincy....1928	45,513	24,745	70,258	5.5	25,080	1,946	890	27.7	663	38.6	4,998	109	63.4
1927	48,063	22,376	70,439	6.4	22,527	1,765	782	25.4	532	32.8	4,017	118	57.9
Chi., Rock I. & Pacific..1928	29,235	20,921	50,156	6.1	19,593	1,507	649	25.6	622	37.4	4,122	128	76.5
1927	31,968	22,969	54,937	5.5	18,843	1,560	659	25.4	546	34.3	3,960	122	72.1
Denver & R. G. Wn....1928	11,190	5,257	16,447	3.7	19,309	1,741	749	25.7	381	22.4	2,442	173	42.5
1927	10,688	5,595	16,283	2.6	17,201	1,628	698	24.6	395	23.2	2,501	176	47.9
Oregon Short Line....1928	7,958	5,428	13,386	4.0	24,870	1,877	775	25.3	599	37.4	3,157	104	63.9
1927	8,481	6,295	14.776	4.9	23,475	1,782	747	25.0	513	31.7	2,987	109	58.0
So. Pacific—Pacific Lines.1928	38,187	31,089	69,276	5.3	23,034	1,889	695	22.6	553	39.0	4,385	116	73.3
1927	35,591	29,854	65,445	5.3	22,299	1,883	678	22.3	547	39.8	4,079	117	70.5
Union Pacific 1928	21,479	14,253	35,732	8.8	36,513	2,148	744	21.5	932	74.9	8,886	100	103.3
1927	22,574	12,304	34,878	9.1	38,474	2,307	765	20.3	854	69.9	8,023	99	86.6
Southwestern Region:													
Gulf, Colo. & S. Fe....1928	9,181	4,889	14,070	3.3	28,859	2,050	937	28.2	516	27.4	3,754	91	54.9
1927	9,135	5,505	14,640	3.6	27,761	1,978	871	28.4	586	33.8	4,434	92	63.0
Mo.-Kans.-Texas Lines...1928	16,423	8,278	24,701	6.5	27,913	2,063	836	24.6	524	35.5	4,077	84	65.3
1927	16,586	6,544	23,130	6.1	25,798	1,958	775	23.4	462	32.5	3,363	92	58.5
Missouri Pacific 1928	28,957	22,267	51,224	6.4	23,746	1,753	742	25.0	666	41.0	4,593	116	78.0
1927	29,423	19,526	48,949	5.1	21,624	1,671	710	25.2	618	37.8	4,127	117	69.7
St. Louis-San Francisco..1928	23,654	9,744	33,398	3.4	19,399	1,453	605	25.3	517	33.7	3,305	139	63.4
1927	21,664	9,543	31,207	3.7	19,548	1,522	629	25.2	510	33.2	3,276	140	57.9
Texas & New Orleans...1928	11,509	13,831	25,340	5.8	18,245	1,265	526	23.9	495	30.9	2,662	96	70.9
1927	11,584	15,337	26,921	5.2	18,326	1,340	551	24.4	502	31.6	2,966	101	78.4
Texas & Pacific....1928	6.612	8.511	15,123	4.8	23,592	1,758	708	27.1	803	51.9	6,024	89	78.2
1927	6,334	4,973	11,307	6.2	22,045	1,666	638	22.6	557	39.0	3,223	93	51.2

News of the Week

(*Continued from Page 783*)

Association. T. H. B. McKnight, vice president of the Pennsylvania, read a paper entitled "Fifty-one Years in the Treasury Department", which reviewed some of the outstanding developments in methods and practices in business procedure during the past half century. Other papers presented dealt with "Delivery of Order and Advise Shipments under Protection of Security" by E. S. Locke, treasurer of the Louisville & Nashville, "Some Phases of Attachment of Property while in Possession of the Carrier," by H. Hurst, assistant to treasurer of the Pennsylvania.

Reports from standing and special committees indicated the trend of activities and accomplishments during the year. Of outstanding importance among these was the report of the committee on collection of freight charges, which dealt with an effort on the part of the shippers of the country to have the period of credit for the collection of freight charges extended. It stated that there is now a petition before the Interstate Commerce Commission with this as its object. A special committee has presented a plan to the Treasury Department at Washington for the elimination of improper assessments of taxes on account of tax-free government bonds. Large sums have been paid erroneously by corporations of the country because of the practice of domestic bondholders of filing incorrect ownership certificates in connection with payment of bond interest. The submitted plan would correct this situation.

A complete set of rules for the issuance, conduct and disposition of bills of lading was presented in the report of the committee on bills of lading, which it is hoped will be generally adopted by carriers, thus securing uniformity in the treatment of bills of lading. Another attempt to attain uniformity of practice was indicaed in the report of the committee on uniform shippers' order bonds which contained two forms of bonds to be filed with carriers for delivery or other disposition of order consignments prior to surrender of original bill of lading or of shipment under straight bill of lading without surrender of proper order to deliver.

The committee on diversions and reconsignments reported a conference with the national diversion and re-consignment committee to the end that a proposition was approved looking to a modification of the tariff requirements, which necessitate the filing with carriers of a certificate by the shipper to the effect that the bill of lading is not available.

The annual dinner on the evening of October 12 for the members and guests of the Association was featured by an address by Eugene R. Black, governor, Federal Reserve Bank of Atlanta.

The new officers are: A. T. Williams, assistant treasurer, Chicago, Burlington & Quincy, president; J. C. Walsh, treasurer, Erie, vice-president; and L. W. Cox, secretary and treasurer.

Traffic

The Public Service Commission of Alabama has granted the petition of the Central of Georgia for authority to operate motor buses between Roanoke and Opelika, taking the place of rail trains. Commissioner Fitzhugh Lee dissented.

The Interstate Commerce Commission has announced that hearings on No. 17,000, Part 4-a, Rates on Refined Petroleum Products from, to and between points in the Southwest, and related cases, will be held at Dallas, Tex., Tulsa, Okla., and Kansas City, Mo., on dates to be announced later. As a result of a conference with the parties the intrastate rates in Texas and Kansas have been included in the general investigation and it has been restricted to include only the higher-grade refined petroleum products.

The Public Utility Commissioners of New Jersey have approved the applications of the West Jersey & Seashore for authority to discontinue the station agencies at Bennett, Mizpah and Brant Beach. The last mentioned is a summer station; the other two orders take effect on October 31. Authority has been given also to substitute shelters for the present station buildings at Eleventh street, Avalon and Peermont. The commissioners have disapproved the applications of the road for leave to discontinue the agencies at Woodbury Heights, West Berlin and Minotola.

Application of the Pennsylvania for authority to discontinue passenger train service on the new Holland branch between Downingtown, Pa., and Lancaster, 41 miles, has been refused by the Pennsylvania Public Service Commission. The company stated that the passenger revenue last year amounted to $13,585 while the operating expenses were $32,596; but the commission held that the accommodation of the public was in this case paramount, and that the loss incurred by the company was not sufficient to warrant abandonment. The Official Guide shows one train a day, each way, and it is said that, including flag stations, there are 28 stops.

Resources and Business Facilities on the Atlanta & West Point

The freight traffic department of the Atlanta & West Point Railroad has issued a series of eight pamphlets designed to attract new business enterprise to the territory along the line of the Atlanta & West Point, the Western Railway of Alabama and the Georgia Railroad. The pamphlets have been prepared on the basis of a survey made by Robert & Company, Engineers, of Atlanta. They describe not only the natural resources and facilities, waterpower, minerals, etc., but also give considerable information about social and business conditions in cities and towns in the territory described.

The several districts, named from a leading town or city are, in Alabama, Montgomery, Opelika and Selma; in Georgia, Covington, Madison, Milledgeville, Newman, and Washington.

Copies of the pamphlets may be had from G. E. Boulineau, freight traffic manager, Atlanta.

Supreme Court to Review Mail Pay Case

The Supreme Court of the United States on October 15, by granting the petition for a writ of certiorari in the case of United States v. New York Central, has decided to review the decision of the Court of Claims holding that the Interstate Commerce Commission, in fixing rates for the transportation of the United States mails, has power to make its order retroactive to the date of the carrier's petition for an increase. The point is also involved in the recent decision of the commission which allowed the railroads an increase of approximately $15,000,000 a year, retroactive for three years.

Publication of International Joint Rates

Oral argument was heard by the Interstate Commerce Commission on October 11 on a series of questions put to the railroads and shippers by the Commission with reference to the publication of rates between points in the United States and points in Canada. The questions arose as a result of a decision of the Supreme Court of the United States upholding a decision of the commission which held that certain rates on newsprint paper between points in Canada and points in the United States were too high. Most of those who presented arguments and filed briefs took the position that the decision of the court requires the publication of rates to points on the international boundary, but representatives of the railroads took the position that the publication of such rates should be as simple as possible and the suggestion was made that the rates published to the station nearest the boundary should be made applicable to the border point by a note in the tariffs. Some of the paper makers represented suggested co-operation between the United States and Canadian commissions with reference to the regulation of the rates, but no representative of the Canadian commission was present.

Portable Freight Containers on the Pennsylvania

The Pennsylvania announces that between certain important points on its lines, portable steel containers are now available for less than carload freight: to be operated under arrangements designed to afford all advantages of motor truck transportation combined with railroad facilities. These containers, transferable by cranes from automobile trucks to platform cars and vice versa, have a capacity of 10,000 lb. each. The floor space measures 6 ft. 11 in. by 8 ft. 11 in. and the doors are 5 ft. 9 in. by 3 ft. 6 in.; total

cubic capacity 440 cu. ft. This new service is at present available between different cities as follows: From New York to Baltimore and Pittsburgh. From Baltimore to New York, Pittsburgh, Buffalo and Cleveland. From Pittsburgh to New York, Baltimore, Buffalo and Cleveland. From Buffalo to Pittsburgh and Baltimore. From Cleveland to Pittsburgh and Baltimore.

It is expected soon to establish the service between New York and Philadelphia in both directions. Shippers who so desire may employ the Universal Carloading and Distributing Company to collect or deliver, which company operates in all of the cities named. The rates between railroad terminals, for transportation in this service, are somewhat lower than the regular L. C. L. rates.

Charles Donnelly Discusses Agricultural Conditions

Despite the decrease in the number of farms in the United States as a whole, amounting to 76,703, and the shrinkage in acreage in farms, amounting to 31,564,363 acres, the states of the Northwest, since 1920, actually show a gain in farms amounting to 13,330 and but a comparatively small loss in acreage, according to Charles Donnelly, president of the Northern Pacific, who discussed agricultural conditions before the convention of the National Association of Farm Equipment Manufacturers at Minneapolis, Minn. Mr. Donnelly pointed out that agriculture in the northwest in recent years has encountered adversities which tested the ability and character of farmers. But out of these hard lessons has come a program for successful and profitable farming throughout the entire area. Figures show growth in acreage and in the number of farms.

"Our country is in a distinctly hopeful and altogether wholesome status at present as compared with the rest of the country, and this situation in my estimation bespeaks the extent of our natural agricultural resources and the constructive manner in which our pioneering farmers have faced and solved their problems in the last eight years.

"In the disheatening period for agriculture, between the years of 1920 and 1925, Minnesota gained, according to the United States census figures, 9,749 farms; South Dakota, 4,898; Washington, 6,979; and Oregon, 5,605. Furthermore, acreage in farms in these states either showed some increase or nearly held its own during this period. During this same period, the figures for North Dakota and Montana show a decrease in the number of farms and acreage in farms, but any fair-minded person must admit that much of this loss was due, to a great extent, to the inability of inexperienced farmers with little capital, who swept in with a homestead rush to establish themselves before the arrival of the post-war deflation test. Authoritative figures for North Dakota and Montana during the past three years show the number of farms to be now definitely increasing and land in farms in both states, according to preliminary 1928 figures, are nearly back to the 1920 high-water mark.

Frisco Merges Freight and Passenger Departments

The St. Louis-San Francisco, on October 15, merged all passenger and freight agencies into one large traffic department, with jurisdiction over both freight and passenger business, thereby taking a decided departure from standardized solicitation activities on American railroads. According to J. R. Koontz, vice-president in charge of traffic, this movement is intended to solidify the solicitation efforts into one large department and obliterate all departmental lines between the freight and passenger units. "We believe," he said, "this will materially strengthen our business-getting force as well as greatly simplify the many ramifications of railroad solicitation work."

Under the new arrangement, S. S. Butler, general freight traffic manager, has been appointed general traffic manager and will head both the freight and passenger departments. J. N. Cornatzar, passenger traffic manager and director of development, has been appointed assistant vice-president. John W. Nourse, general passenger agent, has been appointed passenger traffic manager.

The traffic department has divided its on-line solicitation into four large districts, each presided over by a traffic manager. George F. Macgregor, executive general agent at Kansas City, Mo., has been promoted to traffic manager of the first district, with jurisdiction over western Missouri, Kansas, Colorado and Minnesota and western Iowa. J. R. Coulter, his assistant, is now assistant traffic manager. The second district, comprising Oklahoma and eastern Arkansas is in charge of J. W. James, formerly executive general agent. R. E. Buchanan, now traffic manager at Pensacola, Fla., goes to Memphis, Tenn., as traffic manager of the third district, comprising the Mississippi Valley territory, including Mobile and New Orleans. A. P. Matthews, assistant general passenger agent at Memphis, has been promoted to assistant traffic manager of this district. The fourth district, comprising all of Alabama and the southeast is in charge of D. F. McDonough, formerly executive general agent at Memphis, who now has his headquarters at Birmingham, Ala. J. E. Springer, division passenger agent at Birmingham, has been promoted to assistant traffic manager of this district.

Reductions in Refrigeration Charges from South Recommended

Reductions in present refrigeration charges on fruits, vegetables, berries and melons from points in Florida, Georgia, South Carolina, North Carolina, and Virginia to destinations in official classification territory are recommended to the Interstate Commerce Commission in a proposed report by W. P. Bartel, director of the commission's Bureau of Service, and Special Examiner John L. Rogers following an extensive investigation into the character, extent and cost of protective service. The investigation was instituted in conformity with a request from certain of the respondent carriers. The latter asked a thorough investigation of all the facts and costs involved in the refrigeration service, as the outgrowth of dissatisfaction with conclusions reached by the commission in two former decisions involving refrigeration charges on shipments from Florida. The report says it constitutes probably the most thorough investigation of the kind ever conducted. In place of the present charges, which the report recommends be found unreasonable, maximum rates are recommended for the future based on percentages ranging from 74 to 89 per cent of the present charges.

The conclusion is also expressed that it will be much more equitable for everyone concerned if line haul rates are established which include compensation for no protective service, and a separate charge established for each of the various classes of protective service. If compensation for any of the elements of cost incurred in furnishing protective service is now included in the line haul rates, the report says, it should be removed therefrom and included in a separate charge applicable only to the movement requiring such services, and the commission should direct respondents to revise their tariffs, and their agreements and arrangements with the express company, in accordance with the conclusions announced.

For standard refrigeration service from points in the various states to destinations in official territory the report recommends rates for the future not exceeding the percentages of the present charges as follows: From Florida, citrus fruits and vegetables, 83 per cent, berries, 76 per cent, other fruits and melons, 89 per cent; from Georgia, 81 per cent; from South Carolina, fruits, berries and melons, 80 per cent, vegetables, 85 per cent; from North Carolina, berries, 74 per cent, vegetables and melons, 83 per cent; from Virginia, 80 per cent.

An exhaustive review of the cost investigation and the evidence relating to the reasonableness of the charges is included in the report.

FOURTEEN PERSONS KILLED and many injured, is the report of a collision on the London, Midland & Scottish Railway at Charfield, England, between Gloucester and Bristol, at five o'clock on the morning of October 13. A mail train running at full speed, in a dense fog, collided with a freight train switching on the main track. Three coaches were crushed and the wreck took fire from inflammable goods in the freight cars. Most of the killed were burned beyond recognition. The engineman of the express jumped clear within two seconds prior to the crash, but the fireman, and the engineman and fireman of the freight train were killed. One account seems to indicate that the freight had been prevented by a collision or derailment from clearing the main track.

Equipment and Supplies

Freight Cars

THE CHICAGO & NORTH WESTERN is inquiring for 100 caboose car underframes.

THE PENNSYLVANIA has ordered 1000 steel box cars to be built in its Altoona shops.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE is building 100 box cars in its own shops.

THE CANADIAN PACIFIC has ordered 25 caboose cars to be built in its Angus shops, of these 9 have been completed.

THE CANADIAN NATIONAL is inquiring for 500 refrigerator cars; of these 350 are to be used for the transportation of fruit and the remaining 150 for special meat service.

LAZOTE, INC., Wilmington, Del., has ordered 25, Class 105A tank cars, from the General American Tank Car Corporation. These cars are to be used for carrying anhydrous ammonia.

THE BARRETT COMPANY has ordered 6, class 105 A tank cars, from the General American Tank Car Corporation. These cars are to be used for carrying anhydrous ammonia.

Passenger Cars

THE NEW YORK CENTRAL is asking for bids until 12 o'clock noon, November 1, for rebuilding 50 steel underframe coaches, 70 ft. long.

THE URUGUAY STATE RAILWAYS have ordered a combination passenger and baggage Model 55 gasoline rail motor car, from the J. G. Brill Company.

THE LOUISVILLE & NASHVILLE has ordered one combination passenger and baggage gas-electric rail motor car, from the J. G. Brll Company.

THE READING COMPANY has ordered one combination passenger, baggage and mail gas-electric rail motor car 73 ft. long, and three passenger trailer cars from the J. G. Brill Company.

THE LOUISIANA & ARKANSAS has ordered a combination baggage and mail Model 75 gasoline rail motor car, and one passenger trailer car, from the J. G. Brill Company.

THE CHICAGO, BURLINGTON & QUINCY will construct 20 all-steel suburban coaches, one dynamometer car, and 11 trailers and will convert one steel baggage car into a combination baggage and mail car for suburban use at its Aurora, Ill., car shops.

THE SPOKANE, PORTLAND & SEATTLE has ordered material from the J. G. Brill Company for converting an old style General Electric gas-electric rail motor car to a modern gas-electric car.

THE SOUTHERN PACIFIC has ordered 25 dining cars from the Pullman Car & Manufacturing Corporation. In the *Railway Age* of September 1 it was reported that this company contemplated buying about 25 dining cars.

Iron and Steel

THE CENTRAL OF NEW JERSEY is inquiring for 150 tons of steel for a bridge at Eatontown, N. J.

THE GREAT NORTHERN has ordered 2,200 tons of structural steel for miscellaneous bridge work from the American Bridge Company.

THE CHICAGO & NORTH WESTERN has ordered 500 tons of structural steel for a bridge at Appleton, Wis., from the Wisconsin Bridge & Iron Company.

THE READING COMPANY will divide an order for 30,000 tons of rail between the Bethlehem Steel Company and the Carnegie Steel Company.

THE NORFOLK & WESTERN has ordered 2,500 tons of structural steel for bridges at Columbus, Ohio, from the Mt. Vernon Bridge Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered 114,000 tons of rails divided as follows: Colorado Fuel & Iron Company, 94,000 tons; Illinois Steel Company, 10,000 tons and Inland Steel Company, 10,000 tons.

Signaling

THE TEXAS & PACIFIC has ordered from the General Railway Signal Company material for the installation of automatic block signals on its line between Addis, La., and Johnson, 50 miles. Color-light signals will be used. This section of road is to be equipped with the APB system on both tracks, so that trains may be moved in either direction on either track with equal facility, and there will be remote operation of the switches at Johnson (end of double track); at the crossovers at St. James and John Spur, and at Donaldsonville (two ends of double tracks) where there is a short stretch of single track. Remote operation of the switches and control of signals will be carried out by means of three small dispatcher-control machines. These machines are to be located at three different places.

"Dispatcher-Control" for a Single Crossing

The Chicago, Burlington & Quincy has ordered from the General Railway Signal Company equipment for signaling its crossing with the Union Pacific at Hill street, Lincoln, Neb., by means of electric operation and interlocking, the signalman to be in a tower about one and one-half miles from the crossing. Both lines are single track. The order includes four working levers, five low-voltage switch machines and the necessary relays, etc., for the electric interlocking, which takes the place of the mechanical machine. The crossing consists of movable point frogs.

The dispatcher machine is a small assemblage, four levers, employing the same type of apparatus as that used in the extensive dispatcher-control system installed last year on the Ohio Central lines of the New York Central, and described in the *Railway Age* of August 20, 1927. The arrangement of signals and derails, as they are shown on the illuminated track diagram, is illustrated in the drawing. The two circles at the left and the two at the right denote the light indicators which show, each, the presence of a train on a section of track approaching a home signal. The two other large circles denote indicators each for a track section which includes the crossing. The small circles with an arrow in the center are lights to indicate the direction for which the signal has been cleared.

The signal levers are operated to three positions, upward, central and downward; upward for clearing the home and its corresponding distant signal in one direction; downward for the opposite direction and central for stop. In moving a lever up or down, the signalman merely gives permission for the function to operate; but no operation takes place except when the track-circuit locking is in suitable condition for a movement past that signal. A single stroke gong sounds each time an indicator operates.

This method of control gives all of the protection customary at mechanical interlockings. The interlocking is accomplished at the functions, not in the tower; and therefore, the control machine is simple, requiring few wires. It is said that the cost of installation and maintenance compares favorably with systems providing automatic signals for a crossing of this kind.

When a route has been set and the signal cleared, the derails cannot be moved after a train has entered the approach to the distant signal until the home signal has been placed at stop and has remained in that position for two minutes. Within that time, the train will have stopped at the home signal or will have passed on to the detector circuit.

Crossing at Lincoln, Nebraska

Supply Trade

The **D. S. Mair Machinery Company,** Houston, Texas, has been appointed Texas agent of the **Whiting Corporation,** Harvey, Ill.

The **Timken Roller Bearing Company** has purchased the Wooster, Ohio, plant of the Weldless Tube Company at a receiver's sale. The plant comprises 114 acres.

A. E. Walker, assistant sales manager of the **Republic Iron & Steel Company,** has been appointed general sales manager to succeed **W. B. Topping,** resigned.

L. G. Sever has been appointed assistant to the president of the **Mt. Vernon Car Manufacturing Company,** Mt. Vernon, **Ill.**

T. E. Barnum, chief engineer of the **Cutler-Hammer Manufacturing Company,** Milwaukee, Wis., has been appointed consulting engineer and will be succeeded by **N. L. Mortenson,** assistant to the chief engineer.

The Marquette Railway Supply Company, Peoples Gas building, Chicago, has been appointed special railroad representative of the **Baker-Raulang Company,** Cleveland, Ohio.

E. H. Mattingley, formerly sales representative of the Bradford Corporation, with headquarters at Chicago, has been appointed western representative of the **Standard Auto-Tite Joints Company,** with headquarters at 1336 Railway Exchange building, Chicago.

Ralph K. Weber who has been elected president of the **Mt. Vernon Car Manufacturing Company,** Mt. Vernon,

Ralph K. Weber

Ill., was born in Fairweather, Adams county, Ill., in 1868. After attending the Illinois State Normal University, Normal, Ill., he entered the employ of the Mt. Vernon Car Manufacturing Company in 1890 as a clerk to the superintendent, later serving as shipping and receiving clerk and chief clerk. From 1902 to 1908 he was secretary and in the latter year was promoted to vice-president, which position he has held until his recent election to the presidency.

Henry H. Cust, who has been elected vice-president of the **Mt. Vernon Car Manufacturing Company,** succeeding Mr. Weber, was born in Allegheny, Pa., and entered business in 1880 as an iron broker at St. Paul, Minn. From 1884 to 1896 he was secretary of the Springfield Iron Company, Springfield, Ill., and from the latter date until 1903 was business manager of the New York Commercial, New York. In 1903 he became connected with the Lumber Mineral Company, Mt. Olive, Miss., and in 1918 became assistant to the president of the Mt. Vernon Car Manufacturing Company which position he has held until his recent election. In 1928 he was also elected vice-president of the J. P. Devine Manufacturing Company, Inc., at Buffalo, N. Y.

Henry H. Cust

Obituary

Alfred B. Kreitzburg, advertising manager, of the Electric Storage Battery Company, Philadelphia, Pa. died on October 15, at his home in Springfield, Delaware county, Pa. at the age of 43. Mr. Kreitzburg, whose connection with the Electric Storage Battery Company had extended over many years, had been ill for over a year.

Trade Publication

OIL ELECTRIC LOCOMOTIVE.—A 660-hp., 87-ton, oil-electric locomotive for the Long Island, is the subject of an eight-page publication describing the lightweight motive power recently placed in service on this road. The publication is a reprint by the Westinghouse Electric & Manufacturing Company of an article appearing in the June 23, 1928 issue of the *Railway Age*.

Construction

CANADIAN NATIONAL.—Bids were received until October 11 for the construction of a frame and stucco passenger station and a frame freight shed at Weyburn, Sask., for re-decking and roofing the machine shop at Winnipeg, Man., which has dimensions of 163 ft. by 572 ft., for the construction of additions to the station at Fort Frances, Ont., and for the construction of insulated roof on the roundhouse, machine shop and boiler room at Radville, Sask.

CANADIAN PACIFIC.—This company closed bids on October 12 for the construction of buildings along the new Swift Current Northwesterly branch between Willingdon, Alta., and Strathcona.

CLEVELAND UNION TERMINALS.—Bids will be received by this company until October 22 for the erection of signal tower in the new terminal development at Cleveland.

DELAWARE, LACKAWANNA & WESTERN.—This road will receive bids until October 31 for the erection of its new warehouse at Jersey City, N. J. Plans of this building were outlined in the *Railway Age* issue of October 6.

LARAMIE VALLEY.—A contract has been awarded to N. A. Swenson, Laramie, Wyo., for the construction of bridges, trestles and culverts on the 10 miles of line under construction between Laramie and the quarries of the Molith Portland Company.

MISSOURI PACIFIC.—E. A. Hadley, chief engineer, has announced that the double-track freight line which it is planned to construct before 1932 between Valley Park, Mo., and a point near Jefferson Barracks, will, with the bridge which it is planned to construct over the Mississippi river, involve an expenditure of about $9,000,000. It is expected that the line will have maximum grades of 0.3 per cent and will thus permit through traffic to avoid heavy grades on the present line from Valley Park into St. Louis.

NEW JERSEY, INDIANA & ILLINOIS.—A contract for the construction of a three-stall roundhouse at South Bend, Ind., has been awarded to John Nelson & Co., South Bend, at a cost of about $50,000.

UNION PACIFIC.—Citizens of Laramie, Wyo., will vote on November 6 on the issuance of $184,000 of bonds to pay the city's share of the cost of the construction of a highway viaduct over the tracks of this company. The railroad and the city will each bear about 50 per cent of the cost.

ST. JOSEPH & GRAND ISLAND.—Bids close on October 22 for the construction of a two-story brick and concrete freight station at Hastings, Neb., which will involve an expenditure of about $50,000.

Financial

ATCHISON, TOPEKA & SANTA FE.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $4,008,000 of general mortgage 4 per cent bonds, to be sold at the best obtainable price, to reimburse the treasury.

ATCHISON, TOPEKA & SANTA FE.—*New Director.*—E. L. Copeland, secretary and treasurer, at Topeka, Kan., was elected a director on October 4 to fill the unexpired term of Howel Jones, deceased. His term will expire in April, 1931.

BROOKSVILLE & INVERNESS.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $54,000 of first mortgage 6 per cent bonds to be delivered to the Seaboard Air Line in payment for advances.

CANTON & CARTHAGE.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to acquire and operate a line from Canton to Carthage, Miss., 33 miles, by purchase from the Pearl River Valley Lumber Company and to operate over 1.15 miles of track of the Illinois Central at Canton. Authority was also given to issue $100,000 of stock and $400,000 of promissory notes to be used in purchasing the property and purchasing equipment.

CENTRAL VERMONT.—*Receivers' Certificates.*—The Interstate Commerce Commission has authorized the receivers of this company to use not more than $1,000,000 of a previously-authorized issue of receivers' certificates for the purchase of 10 freight locomotives.

CENTRAL VERMONT.—*Abandonment.*—The receivers of the Central Vermont and the New London Northern have applied to the Interstate Commerce Commission for authority to abandon the line of the West River, from South Londonderry to Brattleboro, Vt., 35 miles. The stock of the company is principally owned by the New London Northern and the Central Vermont owns its mortgage bonds and operates the line. The application states that an expenditure of $205,000 would be required to restore the property to the condition in which it was prior to the floods of November, 1927.

CHICAGO, ROCK ISLAND & PACIFIC.—*Acquisition and Construction.*—The Interstate Commerce Commission has authorized this company's Texas subsidiary, the Chicago, Rock Island & Gulf, authority to acquire and construct a 108-mile line from Amarillo to the Texas-Oklahoma state line. About half of this line has been constructed by the Chicago, Rock Island & Pacific and this line the Gulf company will acquire, constructing the remainder. The new line will form a part of a new route between Liberal, Kans., and Amarillo.

CINCINNATI UNION TERMINAL COMPANY.—*Stock.*—The Interstate Commerce Commission has authorized this company to issue $3,500,000 of common stock to be sold to proprietary companies at not less than par. The commission also authorized the acquisition of control of the company by the Baltimore & Ohio, Chesapeake & Ohio, Cincinnati, New Orleans & Texas Pacific, Cleveland, Cincinnati, Chicago & St. Louis, Louisville & Nashville, Norfolk & Western and Pennsylvania, by purchase of the stock in equal amounts.

DETROIT, TOLEDO & IRONTON.—*Bonds.*—This company has filed with the Interstate Commerce Commission a supplemental application asking it to reduce the amount of an issue of bonds authorized by the commission on April 1, 1925, from $1,181,000 to $1,000,000. The bonds were to be issued to pay the cost of constructing a second main line track between Flat Rock and Durban, Mich., and the application says the construction has now been completed at a cost of $1,001,571.63.

MINARETS & WESTERN.—*Securities.*—This company has applied to the Interstate Commerce Commission for authority to issue $1,500,000 of first refunding mortgage bonds and 19,500 shares of capital stock of a par value of $100. The purpose is to refund notes and bonds now outstanding.

MISSISSIPPI RIVER & BONNE TERRE.—*Negotiations for Sale.*—Clinton H. Crane, president of this railroad and the Missouri-Illinois, stated on October 1 that negotiations are under way for the sale of these two railroads, which are owned by the St. Joseph Lead Company, to the Missouri Pacific.

NEW YORK, CHICAGO & ST. LOUIS.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $11,275,000 of series C refunding mortgage bonds in reimbursement of uncapitalized improvements, these bonds to be pledged and repledged as security for short term notes.

PACIFIC GREAT EASTERN.—*Purchase Offer.*—S. F. Tolmie, premier of British Columbia and president of this railroad, announced on October 8 that an offer had been received for the purchase of the line by financial interests in London. Dr. Tolmie also stated that the British Columbia government planned to make a complete survey of the railway for the purpose of placing a definite valuation upon it.

WESTERN PACIFIC.—*New Director.*—Arthur W. Loasby, president of the Equitable Trust Company of New York, has been elected a director to succeed Lyman Rhodes, resigned.

Average Price of Stocks and of Bonds

	Oct. 16.	Last week	Last year
Average price of 20 representative railway stocks	122.01	119.62	120.30
Average price of 20 representative railway bonds	93.58	93.61	96.

Officers

Executive

John D. Caldwell, secretary and assistant treasurer of the Chicago & North Western, with headquarters at Chicago, has in addition been elected vice-president.

J. N. Cornatzer, passenger traffic manager and director of development of the St. Louis-San Francisco, has been promoted to assistant vice-president, with headquarters as before at St. Louis, Mo.

Richard H. Hollen, assistant secretary of the Jefferson Southwestern, has been elected president, with headquarters as before at Chicago. **Harry S. Stevenson,** has been appointed assistant secretary to succeed Mr. Hollen.

S. M. Baker, special representative for the American Railway Express Company, with headquarters at New York, has been appointed assistant to the vice-president, with the same headquarters, succeeding **W. A. Benson,** promoted. **Paul Gross, Jr.,** statistician, has been appointed special representative, succeeding Mr. Baker, with headquarters as before at New York.

Financial, Legal and Accounting

A. B. Keller has been appointed treasurer of the Illinois Northern, with headquarters at Chicago.

E. C. Mann, assistant secretary and assistant treasurer of the Wabash, with headquarters at New York, has been appointed assistant secretary and assistant treasurer of the Ann Arbor, with headquarters at the same point. He replaces **J. C. Otteson,** who has retired from active service and who held the position of secretary and treasurer.

H. L. Welcer, has been appointed auditor of passenger accounts of the Southern Pacific of Mexico, with headquarters at Guadalajara, Jal. He takes over a portion of the duties of **H. Oberfeld,** who was auditor of freight and passenger accounts, and who remains as auditor of freight accounts. **J. C. Nevenzel,** has been appointed auditor of miscellaneous accounts, with headquarters at Guadalajara, Jal.

George F. Jackson, who has retired from active railway service as fiscal representative of the Southern Pacific of Mexico, with headquarters at Mexico City, D. F., has been connected with railways in Scotland, the United States and Mexico for nearly 52 years. He was born on December 24, 1862, at Kintore, Scotland, and entered railway service on August 3, 1876, on the Great North of Scotland Railway (now part

of the London, Midland & Scottish). Mr. Jackson came to the United States in 1886 and spent the next four years successively in the accounting departments of the Grand Trunk, the Burlington & Missouri River (now part of the Chicago, Burlington & Quincy), the California Southern (now part of the Atchison, Topeka & Santa Fe), the Oregon Railway & Navigation Company (now part of the Oregon-Washington Railway & Navigation Company) and the Santa Fe. From 1890 to 1892 he was claim clerk and chief clerk for the traffic department of the Mexican Central (now part of the National of Mexico) at Mexico City and for the following 13 years he served successively on the Mexican International (then part of the Southern Pacific and now merged as part of the National of Mexico) as chief clerk in the traffic department, assistant general freight and passenger agent and general freight and passenger agent. For a year, Mr. Jackson was connected with the Industrial Lumber Company,

George F. Jackson

returning to the Mexican Central as traveling freight and passenger agent in 1906. He entered the service of the Southern Pacific of Mexico in the latter year as assistant general freight and passenger agent, with headquarters at Empalme, Son., where he remained until 1916 when he was promoted to fiscal representative, with headquarters at Mexico City.

Operating

O. T. Larson, has been appointed marine superintendent of the Ann Arbor, with headquarters at Owosso, Mich., succeeding **R. H. Reynolds,** deceased.

E. L. Bennett has been appointed superintendent of passenger transportation of the New York Central lines west of Buffalo, N. Y., with headquarters at Cleveland, Ohio.

A. V. Baumbach, relief train dispatcher on the Philadelphia division of the Pennsylvania, has been appointed assistant trainmaster in charge of movement, Philadelphia division.

A. R. Pelnar, assistant to the general manager of the Chicago & North Western, with headquarters at Chicago, has been promoted to general superintendent of freight terminals, with headquarters at the same point.

W. C. Pitman, assistant superintendent of the labor and wage bureau of the Western region of the Pennsylvania, with headquarters at Chicago, has been promoted to superintendent of the labor and wage bureau of the New York Zone, with headquarters at New York.

George M. Murray, who has been appointed superintendent of the Delaware & Jefferson divisions of the Erie, with headquarters at Susquehanna, Pa., was born on March 28, 1885, at Binghamton, N. Y. He was educated at Binghamton High School and Binghamton Business College and entered the service of the Erie in September, 1901, as a clerk, serving in that capacity until November, 1904, when he became agent at Great Bend, Pa., subsequently serving in the same position at Canisteo, N. Y., and Dundee, N. J. In October, 1913, he was appointed station supervisor of the New York division and three years later he became chief clerk to the superintendent of terminals. In March, 1917, he was appointed agent at Croxton Transfer and later in the same year he was transferred in that capacity to New York. He was appointed supervisor of stations and transfers, Lines East, in January, 1919, and was promoted to the position of assistant superintendent of terminals at Jersey City in May, 1920, in which position he served until his recent promotion to superintendent.

W. Irving Smart, who has been promoted to general superintendent of transportation of the Canadian National, with headquarters at Winnipeg, Man., has been in railway service in the United States and Canada for nearly 28 years. He was born at Brockville, Ont.,

W. Irving Smart

on February 14, 1876, and received his college training at Upper Canada College, Toronto, Ont., and at Queens University, Kingston, Ont. During 1897 and 1898, Mr. Smart was engaged on surveys for the Dominion Government in Western Canada, entering railway service in 1900 as an assistant engineer on the Illinois Central at Chicago. From 1902 to 1904, Mr. Smart was assistant signal engineer of the Illinois Central, and he then became signal engineer of the Chicago & Eastern Illinois, with headquarters at Chicago. In 1905, he was promoted to engineer of maintenance of way of the C. & E. I. at Chicago where he remained until 1907 when he was appointed professor of railway transportation at McGill University, Montreal, Que. Mr. Smart was vice-president and general manager of the General Railway Signal Company of Canada, with headquarters at Montreal from 1914 to 1917 and until 1920 he acted as a consulting engineer in that city. From 1920 to 1923, he served as a special engineer for the Department of Railways on the Grand Trunk arbitration at Montreal and Ottawa, Ont., then being appointed operating engineer of the Canadian National, with headquarters at Montreal. While at McGill University, Mr. Smart made investigations and recommendations for improvement in operating conditions on the Intercolonial (now part of the Canadian National), the Canadian Pacific and the Canadian National.

Traffic

J. B. Gillman, chief of the tariff bureau of the Rock Island Southern at Rock Island, Ill., has been promoted to general freight agent, with headquarters at the same point.

A. W. Foellger has been appointed assistant general passenger agent on the Michigan Central, with headquarters at Chicago, Ill., succeeding **J. M. Simpson,** deceased.

David S. Mackie, assistant general freight agent of the Michigan Central, with headquarters at Chicago, has been promoted to assistant freight traffic manager, with headquarters at the same point.

Sam S. Butler, general freight traffic manager of the St. Louis-San Francisco, has been promoted to general traffic manager in charge of both the freight and passenger departments, with headquarters as before at St. Louis, Mo. A sketch of Mr. Butler's railway career and a reproduction of his photograph appeared in *Railway Age* of March 17, page 658, at the time of his promotion to general freight traffic manager. **John W. Nourse,** general passenger agent at St. Louis, Mo., has been promoted to passenger traffic manager, with the same headquarters, and the position of general passenger agent has been abolished. **George F. MacGregor,** executive general agent at Kansas City, Mo., has been promoted to traffic manager of the First district, with headquarters at the same point. **J. W. James,** formerly executive general agent at Tulsa, Okla., has been

appointed traffic manager of the Second district, with headquarters at that point. **R. E. Buchanan,** assistant traffic manager at Pensacola, Fla., has been promoted to traffic manager of the Third district, with headquarters at Memphis, Tenn. A sketch of Mr. Buchanan's railway experience, together with a reproduction of his photograph appeared in *Railway Age* on June 30, page 1538, at the time of his promotion to assistant traffic manager. **D. F. McDonough,** executive general agent at Memphis, has been promoted to traffic manager of the Fourth district, with headquarters at Birmingham, Ala. **J. R. Coulter,** assistant executive general agent at Kansas City, has been promoted to assistant traffic manager of the First district. **A. P. Matthews,** assistant general passenger agent at Memphis, Tenn., has been promoted to assistant traffic manager of the Third district. **J. E. Springer,** division freight agent at Birmingham, has been promoted to assistant traffic manager of the Fourth district.

Ira S. Auch, who has been appointed general freight traffic agent on the Lehigh Valley, with headquarters at Buffalo, N. Y., was born at Chalfont, Pa., on May 24, 1881. He entered the freight claim office of the Philadelphia & Reading (now part of the Reading), in October, 1899, where he served until 1904, at which time he was promoted to rate clerk in the general freight department.

Ira S. Auch

Two years later he was appointed soliciting freight agent on the Lehigh Valley at Philadelphia, Pa. In 1909 he returned to the Philadelphia & Reading as assistant chief clerk, in which capacity he served until August, 1913, when he became general agent for the Erie at Philadelphia. In January, 1920, Mr. Auch organized the Nazareth Traffic Bureau at Bethlehem, Pa., and in March of the same year he opened the district freight office of the Lehigh Valley at Philadelphia. On May 1, 1922, he was appointed assistant general freight agent at Buffalo, serving in that position until October 1 of this year, when he became general freight traffic agent, with the same headquarters.

Mechanical

C. W. Frey, superintendent of shops on the Michigan Central at West Detroit, Mich., has been promoted to master car builder, with headquarters at Detroit, Mich. **James Bowen** has been appointed superintendent of shops at West Detroit, succeeding Mr. Frey.

Purchases and Stores

E. N. Bender, general purchasing agent for the Canadian Pacific, with headquarters at Montreal, who has retired from the service of that company after having served 47 years, was born on October 3, 1858, at Quebec City. He entered railway service on June 4, 1880, as clerk in the stores department of the

E. N. Bender

Quebec, Montreal & Occidental Railway (now a part of the Canadian Pacific). Two years later he was promoted to chief clerk in the purchasing department at Montreal, in which position he served until August, 1899, when he was appointed assistant general purchasing agent. Mr. Bender was promoted to the position of general purchasing agent at Montreal in February, 1902, and he served in that capacity up until the time of his retirement.

B. W. Roberts, who has been appointed general purchasing agent of the Canadian Pacific, with headquarters at Montreal, Que., was born on August 17, 1890, at Winnipeg, Man. He entered the service of the Canadian Pacific in September, 1907, as clerk in the treasury department at Winnipeg, later being transferred in the same capacity to the purchasing department at Vancouver. In May, 1912, he was appointed assistant commissary agent and in January, 1913, he was promoted to commissary agent. Later in the same year he became assistant to the chief commissary agent and in December, 1913, he was appointed assistant to the general purchasing agent. He was appointed purchasing agent at Calgary in January, 1919, and later in the same year he was transferred in the same capacity to Vancouver, where he served until December, 1923, at which time he was appointed assistant general purchasing agent at Montreal. Mr. Roberts served in the

B. W. Roberts

latter position until October 10, of this year, at which time he was promoted to general purchasing agent at Montreal.

Obituary

George Bristow, assistant general passenger agent of the Chicago Great Western, with headquarters at Kansas City, Mo., died in a hospital in that city on October 14. Mr. Bristow, who was 65 years of age and had been in railroad service for 40 years, suffered a heart attack on October 12 while in Lawrence, Kan.

J. A. Spielman, assistant to the general superintendent on the Baltimore & Ohio, with headquarters at Pittsburgh, Pa., died on October 7 after a short illness. He was 73 years of age and had been in the service of the Baltimore & Ohio for 48 years, having served as assistant to the general superintendent since 1915. Mr. Spielman was a past president of the Railway Club of Pittsburgh.

RAILWAY PASSENGERS IN SPAIN are required to take out insurance against accident and pay for this protection in addition to the regular price of their ticket, under a decree which became effective September 1. The premium is fixed at five per cent of the fare but must not exceed three pesetas ($0.50).

The plan provides for the payment of 30,000 pesetas or approximately $5,000 in case of death by accident on the journey and for smaller amounts in cases of varying disabilities and injuries. Refusal to take out the insurance is punishable by fines up to 100 pesetas ($17.00) and no exemption is permitted persons who hold private insurance policies.

A scale of insurance rates is also promulgated for livestock protection in rail transportation while reports state that the scheme will later be extended to highway and air transport.